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The Public Health Journal

Organ of Official & Voluntary Health Administration

VOL. IV TORONTO, CANADA, JANUARY, 1913 No. 1

Special Articles

THE OPEN WINDOW

BY J. F. GOODCHILD,

L.R.C.P., (LONDON), M.D., B.SC., PUBLIC HEALTH, (EDIN.).

A patient of mine recently complained to me that it was almost impossible for him to get a room in a boarding house where he could have the privilege of an open window, and, in consequence, he had to suffer from lack of fresh air. Similar complaints from others suggested the subject—"The Open Window."

I will, therefore, mention the necessity for a supply of pure air and emphasize one way at least of helping along in the matter of supplying this necessity. Let me point out, then, that the open window is not by any means a small factor in the pure air problem, and is a channel of health not to be despised.

Those among us who are familiar with the conditions of urban life are well aware of the fact that some 75 per cent. of the houses in our cities and larger towns are inhabited only in part by the lessees or owners. The rooms of these houses are for the most part occupied by other relatives, other families, by numbers of lodgers, or as the landladies say—roomers. These people make up in all a great host of citizens—equal probably to 80 per cent. of the population—in urban places. Taking into account the fact that in early life practically three-quarters of one's time is spent in bed, in older and middle life one-third, and in old age usually one-half, there is then time spent in these houses, even when one estimates only that spent in bed of considerably over one-third of the allotted span. As the mean after life time at birth is about 45 years, it is obvious then that a large portion of this period will be spent in bed. Adding to the time spent in bed all other time spent in these rooms shows the period of life in them to be about one-half of the years in each man or woman's lifetime.

If, then, we could attend a little better than we do now to the admission of pure air into these houses, into these rooms, much will be achieved in the way of adding health to the masses, even though the schools, the factories, or the offices where these people work possess not adequate systems of ventilation.

Looking at the problem in this way we see at once an opportunity afforded which, if taken advantage of, will enable each of these persons to supply himself for one-half, at least, of his days with the great necessity of life—*air*.

The word window, more properly *wind-eye*, is a term applied in architecture to an

Presented before the Second Congress of the Canadian Public Health Association, and revised for *The Public Health Journal*.

aperature or opening in the wall of a building for the admission of light and air to the interior of the hall or room. We have here the definition of the word telling us what the aperature is for, namely, wind (or air) and light. In the north temperate and northern countries where the industrious workers of the world live, we find often that the first syllable of the word has lost its meaning, and the window is used for the admission of light and not for the admission of air as had been originally intended. I suppose it is in our efforts to get away from the cold that we so often forget this great and useful purpose of the window, namely, ventilation. Having inquired of numbers of persons—students, young men and women, and others, living in rooms, also having personally visited these rooms, I have found that only a small proportion of the rooms in many houses contain windows that will open readily top and bottom. In a larger proportion of rooms we have windows that open at the bottom, but not at the top; the upper sash for some reason or other very often is tightly sealed, I suppose, to be sure that it will not fall down or not be left open and allow the risk of dust or rain being blown into the room. Also I found quite a number of windows of inhabited rooms that did not open at all.

This certainly is not as it should be or as the health of the people demands, and as so often it does not seem practical to open the bottom window when persons are in the room because of the much dreaded draught some method should be at hand that every window made might be opened without causing this draft and yet admit plenty of air.

As there is practically no other adequate air supply for this majority of the population of which I speak other than the window, it seems worth while now to make a strong plea for the open window in the homes, especially in the rooms in which the people live.

Again, I would like to show that the window is still to be considered a factor, even in the larger places, and buildings used for other purposes than sleeping and living.

In a recent issue of the Journal of the American Medical Association, the statement is made that the problems of ventilation are perennial in their interest. The pendulum of hypothesis in regard to the assumed toxic properties of atmospheres, stuffy from over supplies of exhaled carbondioxide has swung from one extreme to another.

At the present time there is a consensus of opinion that except in those cases where there is a marked lack of oxygen and a concentration of CO_2, the CO_2 has nothing to do with the feeling of headache, closeness, or malaise so commonly felt by the inhabitant of a poorly ventilated apartment.

The growing tendency now is rather to charge the ill-effects of vitiated air to overincrease in temperature and humidity, and also to the presence of organic matter, factors which alike exert a depressing influence.

Though we may have to wait for the laboratory workers to prove to us the exact cause of the ill-effects of poor ventilation, we do not require to wait for convincing evidence of the crying need of pure outside air; for we do not know its wonderful aid in building up our broken down and diseased patients who have been taken from poorly ventilated surroundings to be placed on the open air treatment in our sanitaria, in the open air schools, and in all sorts of houses and places where the outside air may be used as an asset to aid in bringing back health. If this fresh air treatment can do so much for the person with conditions of disease, surely if applied early it could do vastly more as a preventive measure. Attempts have recently been made to demonstrate the existence of poisons in the expired breath, but this research has not been worked out very satisfactorily, and, indeed, this effort to prove the presence of harmful compounds or to isolate organic toxines has led to rather contraditory results.

Flügge and his pupils have demonstrated, however, that in coughing, speaking, or forced respiration of various types, minute particles, including bacteria, may be separated into the surrounding atmosphere, and this is a form of dangerous contamination which in refined practice the modern surgeon seeks to avoid during his operative procedures.

Roseman and Amoss have carried out experiments, namely: condensing vapors from the expired breath of man and inject-

ing into the guinea pig and after an interval of several weeks or more testing the guinea pigs to determine whether they have become hyper-suspectible to normal human blood. With this delicate anaphylaxis test positive reactions were obtained in a sufficient number of cases to warrant a further prosecution of this study. There has, however, been a tendency in some quarters to attach a significance and suggested application to these preliminary findings which they scarcely as yet warrant. As Rosenau and Amoss remarked, the fact that organic matter is present in air expired, does not mean that the exhaled substances are poisonous, and they report that the injection of this liquid condensed caused no special untoward symptoms in the animals.

Weichardt, however, has claimed to obtain exhibitions of toxicity from injections into animals of condensation water of the expired air.

At any rate though this particular branch of the subject does not seem to have been worked out satisfactorily in the laboratory, we have the first-hand knowledge as spoken of already, and each new experiment along these lines will merely aid further in proving what we now know and believe to be true, namely, that vitiated air, polluted air, is less favorable to health than is the pure the wholesome No. 1.

Few of us, I am sure, will disagree with Swan, who, in speaking before the upper Mississippi Valley Medical Society, said: "Pure air is of more importance in promoting life and health than any other substance on earth. Man can live a long time without food, but can not live five minutes without air. There are many kinds of food and drink that are healthful, but there is only one kind of air that is healthful, and that is pure air.

It is the most plentiful and the cheapest thing on earth and it is said to be 40 miles high, why then should any of God's people be compelled to live without it?"

And now let me bring to our notice some special experiments which go a long way to prove that the open window is not a factor to be despised as an aid in solving the problem of how to provide with fresh air those of us who live or work in houses, as an aid in the solution of the difficult problem of ventilation.

When the Convalescent Home for Children at Broadstairs, in England, was erected, an elaborate system of heating and ventilation was introduced of a type familiar in hospitals and public institutions generally. The idea was to warm the air by bringing it in from the outside over numerous radiators and to extract it by horizontal air ducts in the ceilings of the rooms, these ducts communicating at each end of the building with tall ventilating upcast air shafts. The ventilation did not prove satisfactory and among other evidence of its defective nature was the occurrence of small epidemics of sore throat. It was established that the sore throats very often did not spread from person to person, but broke out in different wards whose inmates had not been in contact. Attention was first directed to the radiators, and it was found that they very soon became covered with dust brought by the incoming air. And, as is the case in so many other establishments, some of these radiators where fixed in positions which made it impossible to clean them efficiently, or their design was such that it was impossible to get brushes between the heating tubes. The institution management came to the conclusion that a good radiator should be of such a design and so placed that it could be cleaned and dusted daily with facility, and, further, that it should consist of polished tubes rendering any deposit of dust easily visible and so stimulate servants if they took any pride in their work to keep the polished surface in a more creditable condition.

Instead of introducing new radiators, however, the inlets were closed so that the stream of dust-laden air no longer passed over them. Attention was then turned to the extraction system, and it was found that the difference of temperature between the air in the ducts and that outside the building was so small that the current was sluggish, and, consequently, easily reserved. An engineer showed by experiment that wind striking the building on one side had a tendency to increase the pressure of air in the rooms on that side and to diminish the pressure in the rooms on the opposite side, with the result that in these latter rooms there was a tendency for the system of ventilation to be upset, causing the passages intended as up casts to act as down casts.

It was found that when there was no wind the ventilation acted perfectly and as was intended, but even when a slight wind arose the air instead of passing away through the extraction passages was drawn down owing to the reduced air pressure in the rooms on the side of the building opposite to the direction in which the wind was blowing. The air ducts and shafts could not be cleaned and were known to be full of dust, which was suspected to be full of objectionable organisms. Under the supervision of the Broadstairs Health Officer the following bacteriological experiments were carried out:

Two plates were exposed five minutes beneath the air shafts in the ceiling in one of the wards, the medium on the one being placed so that it looked upwards towards the opening, and the medium on the other so that it looked downwards toward the floor. Plates were also exposed within the airshafts and on the beds in the wards.

In the plate within the air shaft and the plate immediately beneath it—the culture media on both of which looked upward each showed a rich growth of organisms, whereas on the plates the medium on which looked downward both were comparatively free from colonies. The plates on the beds in the wards showed only a few colonies.

Among the rich groups of organisms found on the plates about the airshafts were pathogemic varieties, including staphyococci and the micrococcus catarrhalis, whereas on the plates remote from the airshafts the pathogemic organisms were exceedingly few. The fact that the plate near the airshaft looking upwards was richly covered with organisms, whereas the plate which looked downward showed very few, proved that the air was travelling into the room through the so-called outlet, and this conclusion was confirmed by the fact that the plates inside the shaft contained the same varieties of organisms as the plate immediately beneath the opening.

The experiment was repeated in another ward after the air shaft in the ceiling had been blocked up and the plates in every instance showed only a feeble growth of micro-organisms. It was then clear that the air in the ward was a great deal purer when the so-called ventilating outlet in the ceiling was closed.

The ventilating openings in the ceilings were, accordingly, closed, the beds were removed from the side of the dormitory and placed in the centre, and all the windows were always kept slightly open, so that the ventilation of each dormitory depended entirely on the passage of air across the rooms, the air entering on the side on which the wind was blowing and finding exit on the opposite side. It was decided that this would be an efficient means of continuously changing the air.

Since these reforms there has been a very appreciable reduction in the number of sore throats and of the few cases which have occurred, practically all have been in children with adenoids and enlarged tonsils or in others who had suffered from repeated sore throats at home. One case of measles and two of chickenpox occurred, but there was no spread of the infection as had been formerly experienced.

The medical report concludes by stating that investigation shows once more that all airshafts are dangerous unless they are so big and so situated that they can be easily and regularly flushed with water. Unless this can be done the airshafts collect more and more dust and the air which passes along them into the building or room becomes increasingly dust-laden, and, therefore, microbe-laden.

Here, then, are experimenters who have proved to themselves, and, I think, also to those who have followed their work, that the window still has claim to one of the chief purposes for which it was originally designed. Here are strong advocates in favor of the open window.

If the open window has proved to be valuable in institutions which have other complete systems of ventilation, surely it is of special need in the home in the rooms were the majority of the people sleep and live, and where very often there is no system of ventilation whatever.

To further substantiate this English conclusion I will cite the experience of the school authorities in one city, Cleveland, as an example of what is happening in many enlightened places.

In this American city the authorities have frankly admitted that the heating apparatus in the schools warms but does not effectively ventilate, and apparently they had no hope of being able to provide

proper ventilation apparatus. For, instead of trying to do so they have adopted the blowing out system. At stated intervals a gong sounds and thereupon the children discontinue their studies and commence marching exercises, calisthenics, or exercise out in the playgrounds. At the same moment every door or window is thrown wide open, the fresh air rushes in, and the classrooms are given a good blowing out. In a few minutes the air has been thoroughly renovated, the gong sounds again and the children resume their studies. This method is certainly preferable to a strong draught blowing in one direction while leaving other parts of the room in a stuffy condition.

I might mention here that the present form of sash window was introduced from Holland into England and other countries towards the close of the 17th century, and as it is now the almost universal form of window, I refer principally to it.

A window opening top and bottom and placed in an external wall is essential in every inhabited room (that is, some kind of a window that will readily open, not necessarily the sliding sash variety, except that I think this form of window so perfect, so adequate for all purposes required will prevail and maintain supremacy as the universally used form) and as far as possible the due northern aspect for windows is to be avoided, as this sunless window hinders much of the good the window can do by giving it no sun, and thereby depriving the inhabitant of sunlight, our most potent rejuvenator and microbe killer.

Besides the window it is necessary to have either a fireplace and flue on the opposite side of the room or if this is not available and is not very commonly used as in our country, then there is needed an opening over the transom of the doorway, and if neither of these necessities are present then the door itself has to be made use of and frequently opened, and especially when the windows are opened.

In adopting the window system of ventilation a central hall or staircase of the full height of the house with ventilating windows at the top, is useful in promoting free circulation of air.

If the fresh air comes in at the window and there is an opening over the door, say on the opposite side of the room, a very efficient form of ventilation is, therefore, attained, and in this connection it is well to remember that the outlet in a room should be at or near the highest point since expired air being warm and moist is lighter than ordinary air and ascends at first to the upper part of the room.

The fresh air coming in at the windows should be arranged as far as possible to avoid drafts impinging upon the occupants, to secure diffusion of the current and to counteract the tendency of the fresh incoming air to sink to the lower level. This may be effected by giving it an upward direction on entering so that before descending it mixes with the air of the room. Air finds its may into a room by the doors and windows, however close fitting, and to a lesser extent through brick or stone walls, through ceilings and floors. These leakages, however, are very small if a proper fresh air entrance has been provided. One of the best inlets is provided when in the window of the double sash variety, the lower sash is raised and a board put in as suggested by Hinckes Bird. This provides a current of air upwards between the lower and upper sash and throws the air high into the room, therefore causing no draft.

Better still than this, because more efficient, is to place a plate of glass on the lower window sill inside the window at a little distance from the sash. Now when the lower window is raised there are two currents of in-rushing air—that underneath the lower sash and that coming in between the lower sash and the upper, both of which currents are deflected upwards.

Another plan is for the upper part of the window to be hinged below and to fall forward and admit air into the room as if by a sheringham valve.

Outlets should be as near the chimney, if there is one, as possible, for the air in that part is the warmest as well as most impure, so that the worst air is removed with maximum velocity. When there are outside double windows used, as in the winter season, and we mostly require them in our climate, the same method may be used, the air gaining entrance through openings in the outer windows and passing upward into the room through the inner window as above suggested.

But in addition to these simple methods of window ventilation we must not forget

what the authorities of Cleveland and of Bradstairs have taught us, namely, that opening the windows and doors widely and doing this frequently are among the most efficient means at our disposal of making the air of the rooms fresh and pure.

In most of our larger buildings, apartment houses, hotels, and shops, systems of ventilation are in use; some are partially effective and some are useless. It is in the small places and homes generally, however, that mechanical ventilation is either absent altogether or wholly unsatisfactory. It, therefore, becomes so urgent a matter for the health of the people in these homes that they should have their rooms ventilated in some way that I so strongly urge the use of the open window. And very specially because the use of this open window will have so great an influence for better health generally and especially will it aid in preventing that dread disease, tuberculosis.

Would it not be wise to introduce bylaws, particularly in our cities, that would make it compulsory that the window of every sleeping room shall be kept open for an hour in the forenoon and an hour in the afternoon, except in cases of inclement weather or the occupation of the room by an ill person or other sufficient reason.

In further support of the open window, let me cite certain conclusions of the Chicago Commission on Ventilation, probably the last word we have on this important subject:

(1) The air in rooms should be kept actively in motion, a sense of stillness is always to be avoided.

(2) During a recess period the windows should be open wide and the room blown out.

(3) The air inside should not be drier than that outside.

(4) All windows used for continuous air supply should be provided with deflectors, probably of glass placed at their bottoms. These should extend the width of the sash and be so arranged as to deflect the air upward when the windows are opened.

(5) In buildings equipped with ventilating systems when the windows are raised to flush out the rooms, all rooms should be flushed simultaneously in order to interfere as little as possible with the proper operation of the ventilating system.

(6) Where schools are heated by stoves some of the air should be taken into the room through windows provided with deflectors. Some of it should enter through a duct in the floor and discharge around the stove.

(7) Where schools are ventilated by unsatisfactory methods great improvement can be effected if to them the following additions are made: If windows are raised and the air blown out at least three times a day.

Many physicians and health authorities now often pooh pooh the draft as a cause of cold or inflammation, but surely they are entirely wrong. I have seen many intances in which the draft has done serious harm to the individual. I myself received a bowel inflammation from a draft. My son received an otitis media catarrhalis that became a purulenta by a draft, and every day we find bad results from the draft.

The evil effect of over-chilling one part of the body by the draught is no myth. We must then be able to open our windows and yet cause no drafts, or when we open them widely we should leave the room altogether or be well prepared for the draft that may result.

In middle English times the window began to flourish greatly and began to be the great means of beautifying, ventilating, and lighting the nation's houses. These being supplied with windows in plenty the Government saw a fine opportunity to replenish its exchequer. A tax was levied on the windows throughout the land. Levied in the seventeenth century, this tax brought in millions of pounds annually of revenue to the Government and was one of the chief methods of taxation for upwards of two hundred years.

This tax was one of the worst setbacks to the cause of sanitation England has known and it was not till the abolition of the tax in 1851 that the people ceased to cut down the number of the windows in their dwellings. It was not till this tax was abolished that the people ceased to put fewer and fewer windows in their houses or ceased to block up the windows that were already in them.

Though we cannot credit to the window all the English advance in sanitation during the latter half of the nineteenth cen-

tury, it is a fact that this great advance did not commence until the very year in which the window tax was abolished—1851.

Quoting again from Swan:

"Millions of lives are being endangered by breathing impure vitiated air. The ravages of tuberculosis will never be eradicated till we have better sanitation in the homes, schools, and railway cars of the country. We cannot build sanitaria fast enough to prevent tuberculosis so long as the breeding places for the disease are allowed to exist. Till compulsory ventilation laws are passed and strictly enforced tuberculosis will prevail."

ROCKWORK AND PLANTS FOR THE ROCK GARDEN

BY RACHEL R. TODD, M.D., C.M.

It is not to be denied that Nature works out her most beautiful and her most permanent effects with water and with rocks. To the thoughtful and observant gardener this statement will come as no new thought, for he has doubtless discovered the truth of it long since, and, taking Nature for his teacher, has worked out many a delightful problem in trying to imitate, or at least follow along the lines she has laid down in planning the vast garden of the world.

It is no easy task—the planning of a garden. Nor is it a task to take up lightly, with the idea in view of casting the work aside, when failures and discouragements come. There is a fascination, a never-ending "looking forward" towards some definite end in view that makes for happiness. No matter what is happening or not happening elsewhere, there is always plenty doing among the flowers. Their story is daily unfolding before our eager eyes. Their disasters or successes are always of the greatest importance.

There is no school for cheerfulness that can equal the garden school. Here, weariness is unknown. The very joy of living is in the air, in the sunshine, everywhere the eye may turn. From the very ground itself comes strength, and contentment falls upon us from the sky. Here, if anywhere, one may learn the true values of life; here, if anywhere, one may learn to cast away all pretence and trivialities; here, if anywhere, one may learn to shake off the thraldom of the things that be, and the fear of worldly criticism.

But, when we speak of gardens, we do not necessarily mean those pleasure grounds of the wealthy, with their row on row of beautifully ordered beds, their rose gardens and their rock gardens, their pergolas wreathed in waving green vines and their arches gaily wound with climbing roses; their shrubberies and their hedges; their flaming beds of blazing perennials, where the stately digitalis looks down in scorn on the saucy pink, perky amidst its clean green grey spikes, and the proud larkspur glorious with its waving spears of amazing blue (what monarch was ever so royal) strives to reach those heights unknown to any save the hollyhock.

Every man may have his garden, though it be but a small backyard, gay with golden coreopsis and purple pansy; a tiny spot of marigold and sweet alyssium; or a dainty border, bravely supporting the creepy, crawly portulaca and thick, carpeting myosotis. Here, in this small spot, all his own, its simple possessor may reap more happiness from his carefully cultivated plants than is obtained by the wealthy man, who leaves all the work, and consequently all the real, enjoyment to his paid gardener.

Is it not true that Max measures happiness by what he himself experiences and not by what someone else experiences? And so, it is quite possible for the one who possesses but a small spot, and who knows his treasured plants, every leaf and blade of them, to reap even more true happiness from his tiny domain, than the man who possessing lordly acres knows none of his plants intimately, or even at all.

But enough of moralizing. This will not dig the garden!

Some Elementary Principles to be Remembered in Planning the Garden.

One of the first principles in planning the garden is "to make bloom the waste places." Following close in importance is the principle of filling up awkward corners or gaps, and concealing unsightly objects. And here it is that we are able to make the most use of our rockeries and our beds of rockwork. A third point is to plan for privacy in the home surroundings, because privacy is essential to charm. Here come in our hedges and our shrubberies, as well as clumps of isolated evergreens. The clever gardener will not forget to introduce an element of mystery also into his plans, because to arouse the curiosity of the observer is to stimulate the imagination. What more mysterious than a winding path, disappearing behind a single shrub or a rockery? What more stimulating to the imagination than a number of double-flowered crimson hollyhocks, appearing suddenly above the level trimmed top of a thick dark-hued close-set evergreen hedge? Lastly, and I think, the underlying principle of every successful garden, every form of decoration introduced into the garden, whether it be a simple rockery or a row of arches, a pergola, cool and shady with heavy scented vines, or a summer house of quaint design, whether it be a water garden or a clump of flowering shrubs, or even one single shrub, to fill a bare and offensive corner — due regard should be given to the principle of proportion.

The most casual observer will not fail to notice what an important part rocks and water may be made to play in the ordinary garden scheme. The one represents the mysterious of all nourishment, the other represents permanence and solidity.

As we plan the laying out of every precious bit of our treasure land, to the best advantage, we must not forget the rockery and water garden, two forms of garden decoration that have come very much to the front of late years.

Combined rock and water gardens are often very successfully managed in quite small gardens, and have afforded much pleasure and satisfaction wherever they have been carefully looked after.

While it is not the purpose of this paper to deal with the construction of the many different forms of rockwork, still a few words on the subject may not prove out of place.

Different Forms of Rockwork.

(A) The rockery is one of the oldest forms of garden decoration. Too often, however, it resolves itself into a mere heap of cast-off rocks and small stones piled carelessly together, the whole loosely cemented together with poor earth and sand, scarcely sufficient to support the determined roots of an unhappy fern or two, or an anaemic and shamed plant apparently desiring to die, in vain. Yet a small amount of thought will serve to turn the self-same rock-pile into a thing of beauty.

In constructing a rockery, or any form of rockwork, the most important thing to consider is, how to avoid stiff, unnatural or formal effects. Anything approaching the straight line should be avoided, because such is untrue to Nature, and above all things, here, we must be true to Nature. Even long lines of stones certainly must not be tolerated, although such are frequently seen, used as edgings to flower beds—and sometimes, alas, painted white, or whitewashed!

Where a bold and rugged effect is desired, several large boulders should be arranged in as natural a manner as possible, in order to give the effect of one large, broken rock. The cracks and crevices may be filled with good soil, because rock plants must have the proper amount of nourishment provided for them as other plants. For this reason, it is wiser to have the body of the rockery composed of carefully prepared soil, rather than being filled in with small stones.

Remember, that rocks, while serving to assist in the general drainage of the soil, can also be made use of to conserve the moisture and direct its course where required. Such being the case, care should be taken, in setting the rocks, to see that they point inwards, that the rain and water may be deflected towards the roots of the plants, and not away from them. If a small sloping surface of bare rock be left open to the sky, it will serve to collect a certain amount of moisture, which moisture will naturally soak inwards, towards the body of the rockery.

Any trees or shrubs used on a rockery must be small themselves, otherwise the proportion will be lost. For that matter,

Fig. 1
See list (a), (b), (c), (d), (e), for plants suitable to this scheme

all plants to be used in the decoration of a rockery or any other kind of rockwork must be carefully chosen, with this same idea always in mind, because if once the sense of proportion is lost, the whole effect is spoiled, and nowhere is it more easy to make this mistake than in the building of rockwork.

(B) Another form of rockwork is the formal rock bed, often seen in large municipal gardens. It will be noticed that these beds are arranged in such a manner that the outline is rugged and irregular and is usually in a sunny position, since most alpine plants revel in unrestricted light. In fact they cannot have too much sun. Hence the need, as above mentioned, of storing up the moisture around their roots.

(C) A rock garden looks well if formed in irregular masses, on each side of a broad winding path. The rockwork may be carried up on either side of the path, in low flat terraces of irregular stone, each terrace being from three to four feet wide, and rising one terrace above the other to the desired height—and here all sorts of delightfully irregular and unexpected effects may be secured, especially if a small trickling stream can be introduced.

Fig. 2
Good arrangement of stones for rockery. Rain may fall in between the stones. Note also at A and B where a base platform of rock serves to catch all moisture that may fall

This style of rockwork has several advantages to recommend it. Many small stones may be used. Different parts of the rock garden can be altered or improved upon without pulling apart the whole structure. All sorts of situations and expostures can be managed with a little planning. The garden is never entirely finished, since the gardener is always planning new effects and working out fresh experiments.

(D) The above idea may be made use of in many small town garden lots where the problem of the closed board fence has made a flower garden almost an impossibility. On account of the high, tight wooden fence all currents of fresh air have been cut off, and everyone knows what an important part air plays in the production of a garden of any sort whatever. Without plenty of air below ground as well as above ground there can be no growth.

Every gardener has been confronted with the problem concerning the north side of the close board wooden fence. The earth in this situation is usually cold, generally heavy, usually entirely lacking in those elements necessary to the growth of plant life. To produce bloom is impossible. Oftentimes growth of any kind whatever is an utter failure. The fence shuts out sun, and light, and air. Sometimes the last element is the most necessary to the case in hand.

Now, why not construct a sloping bank of rockwork, terraced, or not, following along the lines laid down in "C" along the whole length of the fence, or, not, as desired. Boulders of a fairly large size may be used, the crevices being filled in with plenty of smaller stones, in order to allow a good free passage of air, the whole being carpeted with a thinly spread layer of good rich sandy loam.

Most town gardens are from eighty to an hundred feet in length. At least twenty feet of the land on the north side of the line fence might be treated in this manner, at first, as an experiment. Imagine what a change might be wrought in that ugly, neglected stretch of land! The plan can not fail to be successful. Trouble? Of course it will mean a great deal of work. But what about that?

Having finished the construction of the sloping rocky bank, which will, as is readily understood, raise the earth surface some feet above its original height, and also

throw it more in a position to receive the sun, plant a number of bright flowering climbers at the base of the fence, that is, at the top of the newly-built slope, choosing in preference vines that need not be replanted each spring.

Fig. 3

Some suitable plants for such a rock garden are as mentioned, although the gardener himself will know the needs of his garden, the different soils and exposures, drainage, etc. Some suggestions are as follows, however:

Bordering the lower-most terraces, alpines of low close growing habit should be planted. Choose from among the arabises, aubretias, cerastiums, myosotis

As the slope heightens, plants that present definite characteristics should be chosen, selecting varieties of brighter growth as one ascends the slope. Such rock plants are aremeria (or pink); delphinium (or larkspur); aquiligia (or columbine); cyclamen, primula (or cowslip); corydalis, correopres, iris, bellis (or English daisy); and many others. The clever gardener will know how to stamp his own individuality on his garden by his choice of alpines.

He must also keep in mind the underlying principle of proportion in selecting the desired varieties, having also a keen and alert eye for striking effects and harmonious contrasts.

These vines will soon cover entirely the bare hard boards, and form a permanent background to the rocky slope, plants for which will be described presently.

Plants suitable for this rockwork scheme:

(a) For bordering use—
  (1) Arabis alpina, white, 4 to 6 inches, blooming from March.
  (2) Iberis semperverens, white, 4 to 6 inches; from April
  (3) Aubertia deltoidae, purple, 4 to 6 inches; from March.

(b) Asecond border higher up, forming a good background for (a)—
  (1) Cerastium tomentosum, white flowers, 10 inches; from April

(c) Plant next some suitable alpines that will form individual tufts, rising from a thick carpet of green—
  (1) Myosotis, blue flowers, 4 to 6 inches; forms a splendid carpet; from May.
  (2) Armeria, sea thrift, pink, 12 inches; from May.

(d) Now plant a thick border of sturdy individual alpines to conceal the lower portion of the vines to be planted against the fence, such as—
  (1) Veronica, deep blue, 12 to 18 inches; from May.
  (2) Aquilegia caerulae, blue, 12 to 18 inches; from early June.
  (3) Iris kaempferi, cream, 12 to 18 inches; from late May.
  (4) Delphinium, blue, 18 to 24 inches; from early June.

(e) Plant at the base of the fence such suitable vines as—
  (1) Virginia creeper.
  (2) Wisteria.
  (3) Clematis jackmanni.
  (4) Wild grape.

(E) Where possible, there is no question that rock and water garden combined produce the most beautiful as well as the most economical effects. Such a scheme is not, however, often possible, since a certain amount of land is necessary in order that the effect may not be dwarfed.

A rockery which forms the basis for the water garden is sketched below, and has given much pleasure and satisfaction to its owners. It is situated at the very farthest confines of a city lot, some forty feet wide and about one hundred and sixty feet long. Some eighty feet or so from the street line, the lot is divided off by a thick screen of grape vines, the front portion being used as a tennis lawn, while the portion behind the vines containes the water garden. A more secluded and delightful spot would be hard to find. In the farthest corner a giant "Balm-of-Gilead" tree, (whose roots stretch like immense constrictors many feet beyond the vines), towers high above the quiet spot. The silver leaves shiver and

sigh in the sunlight, and when the weather is rainy the air is heavy with aromatic scent of the buds. On the north side stands an old summer house of ironwork covered with a gnarled and twisted wild grape vine, where the bees work in countless swarms, among the fragrant grape blossoms, shaking little stars in millions over the leaf and vine and flower.

When the fountain arrangement is turned on (to be described in a moment) one may sit and watch the birds play in the water in swarms.

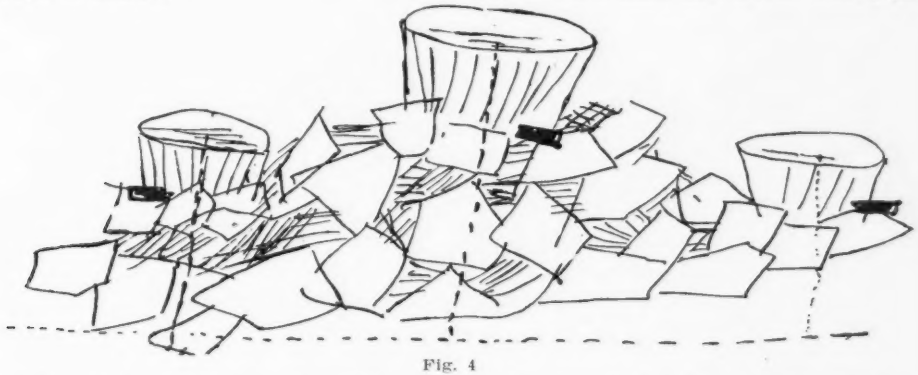

Fig. 4

Some suitable plants for such a combined rock and water garden are: arabises, aubretias, ajuga reptans, myosotis, hepaticas, bells, hen and chickens (saxifraga umbrosa). These are useful for carpeting the rocks.

For single and individual effects select from the following: Dianthus, armeria, veronica, hencheras (coral bells), irises, funkia or day lilly, lemon lilly, verbenae, delphinum.

The following varieties will furnish the gardener plants with striking foliage useful in this scheme, if planted near the level of the tubs: fever few (yellow-green), dusty miller (grey-white), armeria (grey-green), cerastium tomentosum (grey-white), amaranthus (reds, browns, oranges).

In order to obtain foliage producing "spike" effects, seek among the irises, armeria, spiderwort, yucca, gladiolus.

The rockery is built of carefully selected stones of very rugged shape and fairly large size, and is practically three rockeries joined together. Firmly imbedded at the summit of each one of the three is a wide flat tub, tarred well on the outside of the bottom and along the sides for quite six inches. Each tub is fitted with a stout wooden plug, situated just above the floor, so that the water may be allowed to run out slowly when desired by removing this wooden plug. In this way, each tub can be easily emptied, without disturbing in the slightest degree any newly sprouted plants, always a delicate operation as everyone knows who has had experience with acquatics. The refuse water will run gently out of the tub, spreading softly among the cracks and crevices of the rockwork, and thus affording a thorough soaking to the roots of such plants as are growing among the boulders, or carpeting the rocks.

The plan provides for the removal of water that might become stagnant if left too long undisturbed. By allowing the water to run out among the rocks, two purposes are served, namely, the safe and quick disposal of stale water, and the utilizing of this water for the good of the plants.

So much for the disposal of the water. Now, how are the tubs refilled? Supplying each tub is a small inch service waterpipe —the ordinary lead pipe — which runs along just below the turf to the farthest tub on the rockery. It reaches this tub by either ascending straight through the centre of the rockery, or by resting on the outside rocks, finally piercing the bottom of the tub, ascending to the level of the top edge of the tub, and ending in a "threaded" end, this last scheme being added so that a nozzle may be screwed on the pipe at will, and thus a dainty removable fountain is obtained.

Each of the other tubs is supplied in like manner, by a branch pipe coming off from the main pipe, ascending to the bottom of the tub which it pieces in like manner, ascends to the level of the top edge of the tub, also ending in a threaded end, for the purpose of adding a nozzle at will, thus obtaining a removable fountain at each of the tubs.

To fill the tubs, the water is simply turned on, where the individual tap is situated, and the water flows gently out of the threaded end into the tub, disturbing nothing as the tub slowly fills to the desired depth.

Now, I have described this combination water and rock garden as carefully as possible, since it can easily be constructed at almost no cost other than a little labor and thought. There is absolutely no reason why the scheme cannot be duplicated by anyone, and in any garden of small size. There may be one tub or as many as desired. The matter of water supply and disposal is easily attended to, at almost no outlay.

Imagine the delightful result on a sweltering hot summer night when one may slip out into one's own garden and enjoy the refreshing spray from the triple fountains for an hour or two.

Many workable modifications of the scheme will undoubtedly present themselves to the clever gardener.

One other form of rockwork may be mentioned, and that is the kind which forms the basis or lower portion of a hedge, or dividing fence. Many such hedges are seen in the European countries and are very old. The plan has come to be recognized here in this land and already several pretty and useful forms have been worked out.

Anything prettier than a close thick green hedge topping a low rock fence, four or five feet in height, the projecting boulders being covered in many places with bright flowering alpines, or giving root space for creeping mossy vines, is hard to find.

This branch of gardening has been called "Wall Gardening," and is as yet in its infancy, but presents to the eager amateur many splendid possibilities.

Suitable Plants for Rockwork.

To lovers of alpine plants, the rockery is the most interesting and important feature of the garden—in fact it is the garden. As with other plants, each variety possesses certain characteristics, possibilities and requirements of its own. These should be known to ensure a successful selection. The range of alpines is so wide that no difficulty will be experienced in finding those suitable for the purpose in hand. But while all are suitable for rockwork, at the same time allowances must be made for soil, situation and exposure.

Not every rockery requires plants loving shady spots. Nor will it be necessary to decide that the plants to be chosen must be small—or creepers—or evergreens—or cacti—or moisture-loving—or anything else than just what is suitable for the case in hand.

It is rather a difficult task to classify alpines other than in the broadest sense imaginable. One might almost safely say that no matter what is the purpose in hand, a suitable plant may be found for that very purpose.

One word as to soil, before proceeding to the description of a few well-known varieties.

Soil for Alpines.

The soil of all rockwork should be formed on a basis of fairly rich sandy loam, because the plants will not thrive under the conditions under which they have to face, unless they have abundance of good soil from which to draw their nourishment. As a rule, the soil from the surrounding neighborhood is not sufficiently good for a rockery. Remember it will not be possible to fertilize the soil once the rockwork is finished, as is possible with the ordinary garden beds. Therefore, it should be unusually good at the very commencement. Plenty of sand for warmth and drainage, good black loam for rich food, abundance of fibrous material also for drainage, and a fair amount of limestone grit will be very helpful. The great majority of alpines love to feel the warmth of the sun thrown back amongst them by being reflected from a rim of chippings around roots.

Alpines Suiting for Carpeting Purposes.

The first thing to accomplish is to have the boulders covered as quickly as possible, and to accomplish this should plant carpeters with a free hand. When they encroach too greedily, thinning out may be easily accomplished. Do not permit them to smother out other varieties as they will very soon do if close watch is not maintained.

The following are rapid carpeters, and very easily grown, pretty, dainty and all well known: Arabises, aubretias, cerastiums, alyssums, iberises, sexifrages, ajuca reptans, myosotis, veronicas, nierembergia.

It is utterly impossible in an ordinary paper to even begin to describe the vast number of plants, suitable for this purpose. One must be content, therefore, to mention those varieties which have already proved successful experiments.

Arbises (odr. cruciferae). These are very cheap and easily grown plants flowering off and on during mild spells through the winter months, but naturally at their best in the early spring months. At this season they commence to spread rapidly, blooming as they creep along the rocks.

There are several valuable varieties, and are all evergreens, the foliage remaining fresh and crisp through the winter months. This makes the plant valuable for winter gardens, especially since the foliage of some varieties is variegated, one kind having warm yellowish leaves, another having leaves edged with a broad white band, very remarkable in appearance. While the pink flowering plant is exceedingly dainty, yet those two varieties producing white flowers bid fair to remain the most popular. These are arabis alpina, and arabis albida, very dwarf, compact and hardy, growing in tufts, which are covered with terminal flat-topped clusters of pure white crucifer flowers, blooming on and on as long as the sunshine lasts. These plants are perennial, being propagated by seed sown in May for flowering the following season. However, they spread so rapidly that the plants may be divided at the roots again and again during the same season.

Nothing more satisfactory for carpeting bulb beds will be found, the long reaching strands spreading out in every direction. As these plants are practically in flower all the year round, one may have a perpetual flower bank of arabis alone, the white and crimson varieties forming an unusually beautiful sight.

Aubretias are sometimes given the name of false rock cress, and are favorites with everyone. They are perennial evergreen trailers, the spatulate or deltoid leaves forming dense tufts of pleasong appearance. The bloom is a fine soft mauve crucifer, literally covering the plant as with a fine gently waving veil of purple dust. Seldom reaching a height of more than three inches, it soon forms a thick carpet of fairylike hue.

The seed should be sown among the rocks about June in order to make full use of the summer sun to produce strong plants. The bloom will appear by autumn, continuing throughout the winter, if the snow does not cover the ground. Once this variety is fairly well rooted nothing short of uprooting seems to have a bad effect on the plants.

Given one small plant, fairly sturdy, forming a clump about six inches across, in a few months it will have covered some feet of ground, blooming away merrily the while it travels.

A splendid position for this plant is a cleft in a rockwall. Here the long evergreen strands will cling to the surrounding wall, and where it does not gain a firm hold, it will bravely wave its purple laden streamers in the breeze.

Cerastiums (ord. caryophyll) belong to an entirely different order. Common as the dandelion, hardy as the daisy, every country school boy knows well the old-fashioned mouse-eared chickweed.

The chickweed is everywhere; along the garden walk, among the fence corners along the wayside road; in every neglected spot where it has grown, undisturbed for many a season, the plant is very pleasant to look upon. In the cold bare months of the autumn, when the vegetable garden is a scene of desolation, the soft green carpet covers unsightly spots, so thoroughly, that one forgives it for being a weed. It is so soft, so green, so hopeful, despite the stormy breath of approaching winter. The five sepals form a perfect star, dainty as any fairy star that ever dropped down from the blue heavens.

Cerastium tomentosum, however, is the most valuable variety for our rockwork. The stem is low and creeping, crowded with oblong or spatulate leaves of a downy, silvery white. The plant soon forms a perfect mat of gleaming silver, above which appear countless snow-white starry flowers, on forking peduncles about four inches high. The blossom shows distinctly the chickweed characteristic of divided petal, making one think at first, that there are ten petals, so deeply cleft are they. The plant is peerless for the special purpose of carpecting bare spaces, the peculiar foliage being as grateful to the weary eye on a burning summer day, as the dainty flowers.

It is a gross feeder, very greedy for ground, encroaching everywhere as boldly as any old-time buccaneer. Its nickname, "Snow-in-summer," gives one a fair idea of its general appearance.

And now we come to the old-old-fashioned sweet alyssums. I am sure the plant is so well known, it needs no description. What grandmother's garden was ever without its endless borders of snowdrift waving softly among the brown rocks, or edging the long walks leading down to the "bee garden." One might as well expect to find an old-fashioned garden without lilacs, as without sweet alyssum.

Alyssum belongs to the order cruciferae, as the arabis and aubretia do, the bloom being crucifers, sometimes double, always tiny, usually fragrant. The plant is a gross feeder, spreading with incredible rapidity, forming a thick, though delicate mat of tender green foliage.

From its earliest infancy, the plant commences to throw out bloom, and as long as the plant lives it is a mass of dainty white flowers. One has but to look down into the alyssum flower-cluster to discover the reason of its perpetual bloom. In that cluster are a great number of buds in all stages of development, and all these buds are produced from the side of the stem. The growing point of the centre never produces a flower, therefore as the lower and outer flowers mature and ripen seeds, this growing point lengthens and produces more buds. Thus life goes on and on and on, as long as the vitality of the plant lasts. The infloresence is very similar to that of the myosotis, although this latter belongs to another order.

Alyssum saxatile compactum, commonly called "gold tuft," is the yellow flowered variety. This choice little perennial gives to the garden, very early in the spring, one of its sunniest touches. The foilage is rather more of a greyish tinge than the white flowering kind, and remains so fresh throughout the winter that one might almost consider it an evergreen. With regard to soil, all it needs is a fairly sandy loam, well drained. If the seeds are sown in early March an abundance of bloom may be looked for in a few weeks.

Iberises also belong to order cruciferæ. Who does not know the old-fashioned candytuft? My book of reference informs me that the name "Iberis" comes from Iberia, the ancient name of Spain, where the genus is abundant. It is a showy, branching annual of easy cultivation, the stems reaching to about six inches in height perhaps an inch or two more, the leaves lanceolate like those of alyssum, the flowers appearing in flat-topped clusters of a delicate pale pink or purple hue.

There are a number of well-known varieties, the most charming of which is "Iberis sempervirens," an evergreen rockplant which seems to be perfectly hardy in any soil or situation in which it finds itself. It is said to be a native of Crete and is a most delightful little friend, spreading its shrubby stems in the thickest of mats over rock and sand. In company with some one of the early blooming pink family, the two form a pretty and striking combination for rock work of any kind.

The arabises, aubretiæ, alyssum and iberises, as has been shown, all belong to the cruciferæ, or mustard family. These plants are by no means martyrs, as their name might imply. Quite the contrary. They constitute a very sturdy and highly organized floral group, well fitted to survive in the struggle for life.

They have developed and applied two important principles; the first, to make one stem do duty for many flowers; the second, to permit no blossom at the tip of the flowering stem, thus ending its upward growth. Each flower has four sepals, and four petals, arranged in the form of a Greek cross, whence the name, crusiferæ. The family is made up of herbs, mainly, with watery, pungent juice, alternate leaves, and flowers either in racemes or in corymbs.

Saxifraga, rockfoil (order, saxifragæ). This is a large and very important genus of hardy alpine plants, to describe which would require a good-sized volume, and then the half would not have been told.

The genus varies greatly, some of the species producing a thick mossy growth, others large, loose, and spreading. For the rock garden no finer or more satisfactory plants can be found. In themselves alone, there is material for a vast garden of perpetual flowers.

Naturally, such a large family, with members possessing so many entirely different characteristics, will require all sorts of

different soils, situations and nourishment. The mossy saxifrages will thrive in any ordinary soil that is not too dry. The encrusted species do well in a limestone soil. Propagation is by seeding by division, or by cuttings, as the case may be.

Saxifraga cordifolia, a low plant of exceedingly bold habit, forming great masses of large handsome glossy leaves, beautiful throughout the whole season, produces dense panicles of pretty pink and white flowers. Another name for this plant is "mitrewort," and this especial variety should be well-known to all lovers of wild flowers, since it appears in vast spreading beds, in the open woodland around the region of the Great Lakes. The leaves fairly carpet the forest floor and suggest maple leaves, although they differ from these leaves in that they present a rough and hairy appearance. The blossoms are cut and fringed, spreading here and there and everywhere, like crystals of glittering snow, and about the same size.

This plant is the very best that can be chosen for the purpose of carpeting a stretch of rockwork, described above as being suitable for a situation on the north side of a close board fence in a small town garden.

Henchera, a variety called crimson bells, or coral bells, has been lately introduced with much success in many home rockeries. The plant grows in thick, dense tufts, like so many of the saxifrages, forming a cluster of radical leaves from the centre of which rise several downy scapes, about ten inches long; hanging daintily all along the whole length of the stalk, are deep crimson fringed bells. It is a truly fairy plant, bringing up visions of old-time fairy flower lore.

The root of this variety is very astringent. It is, in fact, the well-known alum root.

Ajuga reptans or bugle vine, is a little creeping plant with blue flowers shaped like bugles and borne in spicate whorls. The glossy leaves and rapidly spreading leaves form a delightful setting for the flowers, which cover the low dense vine so thickly that one cannot but wonder how the greedy little thing stops long enough to feed.

For carpeting rocky slopes in a shady situation it is most satisfactory. The foliage remains a clean bright green month in and month out, almost bringing the plant into the evergreen class.

Nierembergia, called white cup (Order Solanaceæ, nightshade family). To those entirely unfamiliar with this order, I would mention the old-fashioned petunia. Everyone knows the petunia. It is the typical plant of the order. Some other well-known varieties are nicotinia, datura, and the trailing shrub-vine described in a former paper, the Matrimony vine. The family is in the main composed of narcotic plants, with long deep cup flowers.

The variety named, however, is the dwarfest kind of dwarf, a creeping, crawling little bush, that forms an exceedingly thick mat about six inches high, of a brilliant light green. The flowers are shallow, cream, white cups, fro mone to two inches across, and just tinged with rose or blue deep down in the throat. It is a dainty plant for rockery, especially if planted where the long creeping stems are able to reach a moist spot.

This little cup flower is the only member of the family suitable for this purpose.

Veronica rupestris (order scrophular) belonging to the figwort family, is a variety of the speedwells, so common to most old-fashioned gardens. It is often called rock speedwell, and is not the only member of this vast family that is content to dwell among the rocks, and be a tiny dwarf. I think of all the "carpeters" described, none can surpass or even equal the unique effect produced by "Veronica rupest." The rapidity with which the plant spreads, reaching out in every direction greedily alert, like the general of old, for more worlds to conquer, presents a perfectly impenetrable mass of dark green velvety foliage; and when the bloom begins to appear early in the spring, the tiny circular blossom an eighth of an inch or so across, clinging to a central stem from three to six inches long, form a graceful raceme of startling blue. As the wee things peer out from among the dark background, one understands the reason for their ancient name, "birds' eyes." When the early spring is well under way, wild-flower lovers will find our meadows and northern pastures embroidered with

these small flowers, not only this particular variety described, but also many white-leaved and variegated kinds, forming great wandering patches of silvery carpet, starred with upstanding spikes of white or violet or warm purplish blue.

The veronicas all like limestone soil, or sandy stretches, but are very particular about getting their feet wet. They do not like this. It makes them so unhappy that they contract a mildew blight which soon proves most disastrous.

They are propagated by seed, root division, or cuttings, and once fairly established on a rocky slope, increase and spread incredibly in a remarkably short time.

I come now to the myosotis, or for-get-me-nots. There is so much to be said about myosotis, that I shall not even commence to say it in this present paper, which has already commenced to remind me of, "And I go on forever."

This much may be allowed, however, concerning myosotis. It has a difficult reputation to live up to, what with history and poetry and fairy tales and numerous other things. And in loving hands, it more than outdoes all expectations.

For the purpose of carpeting rockwork, or making a border, or filling a hanging basket, or making a dainty pot plant, it may be successfully grown. Planted as a border and left alone for a few short weeks —and it has covered everything in sight, conditions being favorable. As it is a gross feeder it needs plenty of water, and plenty of sun. In shady places it becomes weak, spindly and anaemic, and contracts that troublesome mildew blight so detrimental to any greenery.

I learned from experience this summer that even the smallest spray of myosotis will take root, if carefully looked after. Also that if the border has grown too thick and high, the whole green mass may be sheared off as closely to the very roots as possible, given a copious watering, and within about ten days the new growth that has appeared is almost hidden under the countless racemes of pale blue bloom; at the end of each raceme are pink buds in all stages of development, ready to open up next morning as a blue velvet five-pointed star with a bright yellow eye. By shearing my border down to the roots several times during the year, I obtained a constant supply of healthy new bloom until long into October.

I have described thus far only such alpines as are suitable for the purpose of providing, quickly and thoroughly, a hardy permanent covering for rockwork and all manner of bare rocky spots.

Not by any manner of means have I exhausted the number. But sufficient has been said to help out beginners in this work, and to give an idea of the manner in which this work may be carried on.

The gardener in this branch of gardening in no other, will find unlimited opportunities of giving his imagination and his own desires full play. But not only must he know his ground and its possibilities. He must have a fair idea of the general effect to be produced. This calls for a certain knowledge of the plants to be selected, in order that some satisfaction be obtained the first season.

The subject of alpines will be further dealt with next month. There remains many exceedingly beautiful and characteristic plants to be discussed. Also the question of pests and winter protection must be considered.

MILITIA SANITATION A CIVIL ASSET

BY MAJOR LORNE DRUM, M.D., D.P.H.

PERMANENT ARMY MEDICAL CORPS, OTTAWA.

The "swat-the-fly" campaigns that are so much in vogue this year are a decided step in the right direction; but their chief element for good lies not in the fact that a large number of individual flies are killed, but rather that the attention of the public is drawn to the connection between flies and dirt. Any movement or factor that tends to educate the public mind on sanitary matters is to be encouraged, and this

is one. But there are many others; and not the least among them is the training in sanitation given the militia in their annual camps. Our militia is a citizen army representative of all classes and conditions of our country; and any knowledge gained by its personnel, which is capable of application to civil life, must quickly spread throughout the whole population. Sanitary knowledge comes under this head, and my contention is that sanitary lessons learnt in camp are carried back to thousands of homes, to the city and the farm, to the office and the workshop, there to help in the good work of elevating public opinion to require and demand higher sanitary standards.

The militia is growing and developing all the time. About forty thousand were trained this season in camp. City corps now go to camp as well as rural ones. This year saw the successful grafting of the cadet movement on to our militia system, for it saw our first cadet camps. This new development is full of promise and bids fair to bring under militia sway members from every family in the land.

All go to camp for field training under military discipline; and an important part of this training is sanitation. A camp sanitary routine has been established, based on a few easily taught principles and carried out with the aid of a few simple field constructions. It is enforced by discipline and everyone is in contact with it.

From the commanding officer down to the latest joined recruit each has a part in maintaining the sanitation of the camp. No one is exempt; all must do their share. The commanding officer is responsible for the health of his men, and the health of his men depends upon a clean camp. To achieve this result he must enforce the use of efficient methods for disposal of camp wastes; and all must learn what these are and employ them. Wastes are dirt and are to be disposed of, not ignored; and the militiaman who wishes to keep out of trouble soon learns to recognise them accordingly. A working maxim in army sanitation is "provide a billet for every bullet of dirt." It is the duty of the commanding officer to see that such billets are provided. When it becomes necessary to hide dirt, something is wrong with the sanitary organization; some billet has not been provided, or if provided its use has not been sufficiently explained. This is where the sanitary officer and his assistants, the regimental medical officers, come in. Daily and hourly they are explaining, advising and teaching their brother officers, and through them, their fellow-soldiers, that wastes are dirt, and mean sickness if not disposed of. Their duty also is to point out, and if necessary, demonstrate the rational methods of doing so. These methods are not things of chance, but have been evolved by experience based on modern sanitary knowledge, and are laid down in regulations. Various constructions have been devised which though temporary in character and made of improvised materials, yet are capable of providing efficient billets for everything in the way of filth bullets connected with camp life. Description of these may be found in many articles published on the subject, such as one by Major Clarke, P.A.M.C., published in the February number of the Public Health Journal.

To bear out my contention of the sanitary lessons to be learned in camp, let me dilate upon one of the many phases of camp sanitation, the disposal of kitchen wastes. The rule in camp is to burn everything burnable, and only to bury what has been proved unburnable by passage through the fire. The pollution of camp grounds by the burial of putresc[illegible]ible matter is not allowed. What a surprise it must be to many a farmer and shanty-town dweller, accustomed to see kitchen slop water thrown out of the kitchen door, to have explained to him that this waste water is only so much filth in solution; and that on being thrown on the ground, though the water drains away, the filth remains on the surface, to attract flies and furnish them with breeding grounds. What an object lesson it must be to them to be shown simple methods by which this liquid may be strained, and the solids collected and burnt. What a new light it must be to many a town-dweller to learn that barrels and tins of garbage waiting day after day for removal are not only unsightly, but also harmful. In camp he learns that garbage must be removed and disposed of properly, not only daily but immediately. How many town-dwellers ever think of what becomes of their garbage once it is remov-

ed? The farmer but too often uses the nearby manure heap as a place of final disposal; while the townsman has grown callous to the unsightly dumps with their swarms of flies that disfigure the outskirts of too many of our cities. Custom has made him look upon them as unavoidable concomitants of city life. In camp he sees—and is responsible for seeing—that the garbage collected after each meal is burnt immediately in incinerators. One can easily imagine an intelligent militiaman on his return to his home insisting that more use be made of the kitchen stove in this respect, and also as a voter taking a more active interest in municipal arrangements for the efficient removal and disposal of such refuse. Other phases of camp sanitation, from the protection of water supplies to the disposal of stable litter, might be dilated upon in a similar vein and similar conclusions drawn.

Many a man of delicate sensibilities in the old days never returned to camp after one experience. The unsanitary conditions were so nauseating that he could not face them again. Others did, and like the townsman with his familiar town dump, grew callous and indifferent. Few ever thought that these accumulations were harmful and avoidable. But conditions have changed since then; now all wastes are disposed of without offence to the eye, and so completely that they cannot cause disease. During the last four or five years the methods devised for waste disposal of all kinds have become so complete that they have been embodied in an authorized routine followed at all our camps. The comfort ensuing need not be mentioned. Ask the old camp soldier; he will tell you. We aim at a dirtless camp, and therefore a flyless and a healthy one. Our statistics show we are succeeding. Diarrhoea, so frequent a visitor in the old camps that it was known as the "camp sickness," has lost its premier position on our sick reports. Other intestinal diseases have diminished in the same ratio, and we have been able to reduce the old-time scale of hospital accommodation in a marked degree.

The custom in civil life is to keep dirt out of sight as much as possible, by putting in the background the places where dirt is apt to be made. This used also to be the custom in our camps of other days, but not so now. The rule to-day is to put all such places as much in evidence as possible, where all may see, and especially those in authority. For these places must not be dirty. There is no need for dirt to accumulate, nor any excuse for hiding it. The means to dispose of it are at hand, and if not used, some one is to blame, and is blamed promptly and without fail.

Such are the underlying ideas that govern sanitation in our militia camps. There is a billet for every bullet of dirt, each billet as simple and workable as possible; and all provided with the same object in view,—to eliminate dirt and promote health. That is the lesson preached to our militiamen in camp, from start to finish; and not only preached but practised. The medical officers in their role of sanitary officers give the reasons and lead the way, but they are not the only teachers. Everyone in authority from the Camp Commandant down to the cook must enforce the sanitary regulations; and to do so effectively, they must grasp their true significance, each according to his station. For it is Tommy who does the work. It is Tommy Militiaman who wields the shovel, pushes the barrow and tends the fire; and as he works, he reasons and wants to know. Like the rest of his brother Canadians, he has an enquiring mind, and works better when he understands why. It is for his immediate superiors, his company officers and non-commissioned officers, to tell him why; to tell him in plain and simple language that he may understand. To do so they must first understand and grasp the fundamental reasons themselves. That an efficient sanitary routine has been established and works smoothly is proof that they do.

Every man in camp is daily teaching or being taught sanitation. Can such practical work fail to do good or are the lessons completely forgotten on return to civil life? Surely not! How many hunting, fishing, and construction camps have been benefited by examples seen in militia camps. How many summer cottages and farm houses have been cleared of unsanitary surroundings by owners inspired by the militia training in sanitation. How many municipal electors have been equipped with a better understanding of the essentials that should underlie the sanitary administation of their communities. Surely very

many; and the number must increase as the militia develops.

If these conclusions are just, and I think they are, then militia sanitation is an important civil asset, and worthy of recognition as a serious factor among the influences that are tending to educate public opinion in the interests of public health.

THE HYGIENE OF BUILDING FROM AN ENGLISH STANDPOINT

BY PERCY L. MARKS.

We are too apt to assume that the consideration accorded to sanitation is a modern story and not ancient history, and yet we trace it back to the days of the Romans, at any rate, when we are confronted by that wonderful Cloaca Maxima for draining and sewering the city of Rome. And the very name of it—Cloaca Maxima—suggests that cloacae were in general vogue for properly draining buildings of all kinds. The hypocausta for heating, the flues for ventilation, and the aqueducts for water carriage prove the Roman thoroughness in their attention to sanitary and hygienic requirements. In the Middle Ages all this was neglected; there was a plentitude of official godliness, but a gross disregard for the proximate article of cleanliness. And then in the second quarter of the 19th century, there was an awakening from the prolonged lethargy of Sleepy Hollowdom, and with our customary British oblivion of facts, the glories of sanitation were regarded as of quite contemporary growth. The early and mid-Victoria publicists patted their own backs because of their grand discovery of the fair maid Hygeia. In the year 1842 was published the "Report on the Sanitary Condition of the Laboring Population of Great Britain," concerned largely with the condition of the poor and their dwellings, and the date of the appearance of that report is, according to Professor Gairdner, regarded as "the true starting point of modern sanitary legislation."

Hygienically regarded, the question of the site and its aspect is of great importance, in regard to shelter or lack of shelter, the height above sea-level, its own relative or absolute horizontality, the neighborhood of anything objectionable or noxious, etc. Ground drainage is not a necessary consideration under buildings, which are now rendered impervious to ground moisture by means of concrete foundations and damp-courses for the walls, and a concrete bed over the general surface of the site occupied by the building. Where the soil is loose and open and the rainfall is not inconsiderable, the ground in the proximity of a building, and for a respectable area beyond it, should be drained by means of agricultural pipes, ranging from 4 feet to 8 feet below the surface, and spaced in lines at intervals of 12 feet to 18 feet, the system being carried away to a suitable outfall. An ideal site for ordinary domestic purposes would be on the upper portion of the slope of a hill, sheltered from the quarter N.W. to N.E.; for, though this leaves exposure to the blusterous and rainy S.W., yet the compensating advantage, obtained by the full benefit of the sun's rays, is adequate. To be situated at the base of a hill is not by any means ideal, nor is a steep incline desirable. Proximity to a cemetery or to a churchyard, to a tannery, a brewery, a slaughter-house, to chemical works, or to a foundry is also not ideal. Not that these are necessarily unhealthy neighbors; but that the effect of imagination or sensitiveness may exercise a deleterious influence over the human organization. I would have included the proximity of a fever hospital in my list, were it not for the fact that the non-infected zone, required under the regulations of the Local Government Board, effectually obviates any possible practical objection on the part of reasonably-minded folk. The objection to the proximity of a cemetry or a slaughter-house is mainly sentimental; but sentiment is a factor to be taken into account. If the site is abutting on or ever near the

road, along which may be seen the frequent passage of funeral processions or the pageant of the beasts being driven to slaughter, the imagination needs not to be excessively lively to induce a feeling of depression, and even of nausea, which may easily lead to a reactionary influence upon health.

Before referring to certain points, customarily regarded as sanitary, I wish to make a few remarks upon some that are more to be looked upon as hygienic. Proper ventilation, lighting, and warming are almost as important—indeed, I may say, are quite as important—as good sanitation. And what should we mean by proper ventilation? It should be that conjunction of controlled inlet of fresh air and free extraction of vitiated air (for we need not, nor should we have to talk of, foul air) which will maintain a constant level of purity in the atmosphere, without causing any sensation of draught on the one hand or any suggestion of nausea or migraine on the other hand. I will not enter into competition with such an eminent authority as Dr. Louis Parkes; I would prefer to invite the attention of my audience to his work on hygiene for all the synthetical treatment respecting warming and ventilation. Suffice it here to say that whether regarded scientifically or empirically, the accepted cubic space desirable per individual in a room, under average conditions, is 1,000 cubic feet, on the basis of a complete change of air three times per hour. In fever hospitals the cubic space is desirably much greater, being generally entered at rather more than 2,000 cubic feet, and maternity wards are also on a higher scale than ordinary rooms. The resulting ventilation may, of course, be obtained in different ways. There is the vacuum system, where the vitiated air is exhausted by means of fans, the fresh air (warmed or otherwise) entering automatically to take the place of the extracted volume. There is the Plenum system, the system of propulsion, where cleaned and warmed external air is forced in by means of propelling fans, the vitiated air being driven out before it—a method which has its advocates, but one that is not the object of universal admiration, as the required closed condition of all the windows promotes a heaviness of atmosphere and a languorous mood against which people are wont to inveigh. Thirdly, there is the natural system of ventilation, as contrasted with, even opposed to, mechanical methods. This system proceeds on the basis of humoring and adapting the known qualities of the air to the requirements of the building. I recall one occasion of testing its methods within my own experience. A client complained that his bedroom suffered from a plague of flies, and I could see for myself how they darkened the face of the room to an extent almost inconceivable. In concert with Mr. Robert Boyle I arranged a system of simple natural ventilation, with the result that on its installation the flies disappeared, as if Moses had raised his inspired staff for their dismissal. Of course, the chief merit lay with Mr. Boyle; I, as superintending architect, merely modified his suggestions as seemed to me advisable for special reasons. And here, en parenthèse, let me remark that this is how architects ought to act. Was it not Lord Brougham who remarked (doubtless for biographical purposes) that "a man should know something of everything, and everything of something," and was it Daniel O'Connell or Sugden (Lord St. Leonards) who retorted bitingly that "if the noble Chancellor had known a little law, he would have illustrated his own dictum in his own person"? Now, architects should not profess to be specialists in everything; they should always be ready to consult specialists on the various points submitted to them, and they should be satisfied to keep the guiding reins in their hands for the purpose of efficient control. It is important, too, to remember that air, once exhaled from the lungs, should be carried off and away, without letting it become mixed with air proposed to be inhaled, and as warmed air naturally rises, let it continue to rise, and thus provide vitiated air outlets near the ceiling, and fresh air inlets, not at the floor level, but at a few feet therefrom. Buildings should be well lighted; dark spaces connote disregarded collections of undesirable matter; and if they do not connote, yet dark spaces certainly invite eyestrain and nervous breakdown. Scientifically based proportions for lighting area have been tabulated, but it is difficult to credit the value of these proportions, except as a "Guide to the Perplexed." It has, for instance, been recommended that for each

70 cubic feet of air space in an apartment there should be 1 square foot of glass, and other proportions on different bases of calculation have been advocated. But these are, to an extent, rule-of-thumb methods that do not need to be regarded too rigorously. What ought to be borne in mind is that whilst it is proper to insure against unlighted spaces, an excess of light is also detrimental. But of the two extremes, excess of light is preferable to a deficiency of light.

I will enter a few remarks as to aspect. For a bedroom an easterly window (not necessarily due east—in fact, E. by S. is preferable) should be provided under the best conditions, for this admits the early rays of the sun. Of course, in practice it is customary for bedroom windows to face round a great portion of the compass, but that does not affect the principle of aspect. And, in passing, it may be added that in the relation between the bed and the window, facing-light is the worst position, and a left-hand is the best. After the bedroom, regard the living room department. This will mean two, three or perhaps more rooms, being one only where small flats and workmen's dwellings are concerned. There may be the morning (or breakfast) room (or both), the boudoir, the gentleman's room (i.e., his soi-disant "study"), the dining room (under certain conditions), the drawing room, the kitchen (under ordinary conditions), the servants' hall (when provided), housekeeper's room, etc. For a living room generally, and for boudoir and gentleman's room, E.S.E. to S.W. may be taken as the variation for aspect; for a morning room the S.E. variables; for a mere breakfast room, E. to S.E.; for a drawing room, S. to W.S.W. A kitchen should be primarily regarded as a kitchen, when by preference the aspect will be in the compass quarter E. to N.; but if also used as the servants' sitting room, E.S.E. to S.S.E. would be desirable, so regarded. A library should be north, and north only. The subject of warming will meet with but scant consideration in my paper; not that I would minimize its importance, but it is, perhaps, less intimately hygienic than the subjects of ventilation, lighting and sanitation. Strictly regarded, however, ventilation and warming should not be disassociated, under which circumstances the intimate relation between warming and hygiene would be at once made manifest. And it must be remembered that warming should be warming, nor scorching or drying the air, or in any way rendering the effect enervating. It may almost be said that correct heating, when effected by mechanical means, is the result of empiricism, though it assumes the form of a scientifically-based tabulation. But as I intimated earlier, science is itself built up for practical purposes upon an empirical basis, though fundamentally it is independent of, and superior to, the latter. Accepting matters as they stand, however, we are furnished with a plentitude of tables to indicate the quantity of 2 inch, 3 inch, or 4 inch pipe that should be provided under given conditions, and doubtless in a majority of cases this answers satisfactorily. As regards radiant heat from open fires, it may be a wasteful method and thoroughly unscientific; but as long as human nature, as exemplified by "John Bull," remains, so long will there be a healthy love for the cheery open fire, with its wasteful darting flames, its more or less deceitful glow, and its reprehensible current of roaring flames skywards. The day when the poker can be relegated to the Victoria and Albert Museum will be a day edged in black for me.

At long last I have reached the point which has been the object of my desire ab initio—namely, the point whence I shall start to make more or less pertinent remarks on hygiene in connection with the planning of buildings. It is, of course, largely a question of grouping—largely, though not entirely so. The avoidance of draughts is an important point for consideration, and, to this end, doors and windows vis-a-vis to each other or to one another, are undesirable. Nor is it well for a door to be placed in the wall, contiguous to and overlooking the length of the fireplace; when the door is opened it produces a draught by the hearth more pronounced than in any other position, and only to be obviated by the interposition of a screen. The best relative positions for door, window, and fireplace are probably as here detailed; if we start with an assumed writing table, placed more or less centrally; the fireplace to face the writer, the door to be to his right, and opening

against, not towards, the fireplace; the window area to be treated (in a moderate sized room) as two separate openings to the writer's left, a solid wall confronting the more or less centrally-placed door in the opposite wall. Where writing facilities may be disregarded, a left-hand light is not of importance, as for instance, in a drawing room, where such a lighting scheme would never be considered. In a small room an angle fireplace has distinct advantages, though this is not a hygienic point. But the others just mentioned are assuredly hygienic points to be borne in mind, except that the reference to door-hanging is hygienic only so far as the promotion of a sudden draught between the fireplace and the open door is concerned, and is of effect only when the former is being used as a focus of attraction. Another point is to obviate draughts between the front or other entrance door and any of the rooms. This satisfaction may be most frequently secured by interposing, if only a small vestibule, or by so deflecting the currents of air as to produce the like happy result. This deflection may be obtained by the use of a projecting porch with the opening set at one side. A staircase well is a fruitful source of draughts; but this feature is so commingled with the desire of possessing spacious and artistic or picturesque staircase treatment that it is difficult to effect a cure, except by using the well for a lift-run. The inter-relation of the living-rooms and the kitchen is of importance, so far as the non-transportation of odors is concerned; for, with people who are in any degree neurotic, the insidious attack of such odors has an irritant effect upon the olfactory organs and the nervous system. A dinner service hatch giving direct communication between the kitchen and the dining-room is very trying in this connection. Similarly with the inter-relation in regard to the water-closet, which is frequently improperly ventilated and improperly placed. How often in the average-sized town house do we find it situated halfway up the principal staircase—perhaps the worst possible position for selection. But if it were merely from the standpoint of want of privacy, I would not deal with it here; it is the hygienic objection that justifies—nay, calls, for its condemnation in this place. And its inter-relation with the bedrooms should be likewise carefully considered. Speaking generally, if it can be kept entirely detached from every room, other than a bathroom, it will be best so arranged. And there should be also entire detachment from all places where food is stored or cooked; but this is too frequently disregarded, though here, also, the Public Health Acts are gradually effecting improvements. Hygienically, it is a mistake for habitable rooms to be unduly high in proportion to their area; it tends to a stagnation of air, which is the negation of good ventilation. But how are we to find out what is the proper height, either absolute or relative? We may start with a minimum height of 8 ft. 6 in., for with any lesser height the ceiling would seem to press down upon the heads of the users of the room. But having fixed a minimum, how can we find a maximum? I fear not; we may, of course, say that we cannot conceive of any room in an ordinary house being 30 ft. high, but how much nearer can we approximate a maximum. We can say that a cube room would, perhaps, be a desirable maximum, but further we cannot go, leaving it then a matter of hypothesis and a matter of proportion, not of dimensions. Respecting hospital-ward capacity, I will concede a slight difference respecting data; for, by means of accumulated experiments, which results in experience, it is perhaps possible to say that such and such a minimum of cubic space is requisite, in order to promote convalescence under average conditions, and that such and such a lineal wall space between patient and patient is desirable. This being so, and allowing for the necessary central gangway in a multiple ward, the desirable height is thus obtained. But when we are considering the spacing for barrack wards, for workhouse and school dormitories, and for other and smaller apartments, unconnected with people in an abnormal pathogenic condition, we are confronted at once with more empirical bases. For though scientists may say that all is properly based upon the assumed fact that a certain small fractional amount of CO_2 per 1,000 cubic feet of air is the admissable maximum, yet we must bear in mind that far other conditions are allowed to prevail outside hospitals and infirmaries without disturbing (not to say disastrous) results.

We must, therefore, be careful to distinguish between scientific formulæ and tables affecting people abnormally conditioned in regard to health and between all others. The Factory Acts, Building Acts, Health Acts, and others may, it is true, lay down instructions on such points, but I must emphasize the fact that there is no scientific accuracy about such instructions, though it may be conceded that they are far more than merely academic. It is, of course, most desirable that bathrooms, lavatories, water-closets, housemaids' closets, and scullieries should be placed against external walls, and, as a natural sequence, be lighted and ventilated in an outer wall. Even as the relative horizontal grouping of the living rooms and the kitchens is to be regarded as hygienically important, so, too, is their relative vertical grouping. If a dinner service lift is installed, with its intake situated in the kitchen; then its outlet should not be in the dining-room, but in a lobby adjoining; otherwise, the penetration of odors will be pronounced, which would prove trying, and, perhaps, injurious, to delicate nervous systems.

When considering hygienic construction, it seems fitting to consider simultaneously the point of hygienic materials; otherwise, there might be overlapping. Firstly, thin walls are detrimental to health in such samples of climates as the British Isles possess. Common bricks are naturally porous, though of late years there has been an increasing manufacture of denser stuff. Habitually, however, the atmospheric moisture penetrates readily, with the result of a general tendency to levelling of the internal and external temperatures, causing rooms to be hot or cold in sympathy with the rise or fall of the mercury. This is, of course, a mistake; the internal temperature should be able to be maintained easily some 10 deg. higher or lower than the external. In the good old days, when defensive building was in vogue, walls were built perhaps 10 ft. or more in thickness, so thick, indeed, at times that they would contain hidden rooms, tortuous corridors, and winding staircases in houses such as Woodstock, on whose site Blenheim now stands. Whatever defects they may have had from a sanitary standpoint, they were certainly not subject to sudden and unwelcome changes of temperature—except such as might be provided by a conflagration. I do not forget that the houses of the commonalty in general were not so constructed; but even the latter were structurally superior to many, very many, of our modern edifices. It is well, where a wall face is exposed to very humid influences, that it should be protected either by weather-tiling or stucco; if it be a driving damp, stucco is preferable. Slate—the ordinary slate—makes a pervious roofing material. In fact, for the ordinary urban and suburban house, all possible means seem to be taken so as to insure uncomfortable conditions of existence. Again I must interpolate that I do not forget the numerous tile-hung roofed houses that are to be seen, but I have in mind the general treatment of the long-suffering public. Lime-and-hair plaster is not a notably sanitary material to employ; it is too apt to harbor vermin; and the superhanging of wallpaper upon wallpaper is a prime factor in similar harborage. Let me tell you of an experience of my own with some small shop property in South London with which I had to deal in the way of repairs under a Schedule of Dilapidations served on my client. When the workmen commenced stripping the walls of the bedrooms they were able to count as many as eighteen separate papers, besides which there was a massed thickness that represented a half a dozen or so more; that is to say, there were some twenty-four or more papers in all, and the inference is that, in the whole course of the life of these premises not a single paper had ever been stripped off before hanging a fresh one. Noxious vermin were like thick velvet pile o nthe walls (as I saw for myself), and the unfortunate workmen (than whom none ever worked more satisfactorily under my superintendence) had to take a bath when they got home before they could think of tea or recreation. I have been in plenty of vermin-haunted properties, but none so bad as that; and so cautious was I to protect my own precious person that I did not deprive the owner of any of his perquisites, alive or dead. Decaying or insufficiently seasoned and imperfectly ventilated wood is also unhygienic. Dry rot is a terrible foe to encounter under any circumstances. When I say under any circumstances, I have in mind the following anecdote: An ecclesiastical architect was inspecting a

church, accompanied by the rector and one of the vergers. The architect sniffed audibly, and said, "H'm, plenty of dry-rot about," and the verger quite innocently replied, "Ah, but it's nothing to what there is in the pulpit, as I knows, when I comes on a Sunday." The rector's feelings may be imagined. Lead and copper should, by preference, not be used for storage cisterns connected with table service; in fact, galvanized iron is now customarily employed. Thatched roofing is very pleasing in appearance; but, besides the fire risks attaching to its use, it is also apt to harbor vermin. Its good quality is the maintenance of an equable temperature. Oxide of lead paints should be avoided, as they are of a poisonous nature. Oxide of zinc and some of the many varieties of water paints may be safely employed. Arsenical wallpapers are a source of danger, particularly in bedrooms; poisonous particles may become detached and enter into the organs of those using the rooms. It is a popular mistake to think that only green tones contain arsenic. But the use of these papers is easily avoided at the present day.

There is great merit in choosing good lavatory basins, baths, and closet apparatus. The basin should be self-cleansing, and should have an accessible overflow—in so many lavatory basins may be observed soap that has clung to the sides, even after a flush, and so often do we become unpleasantly cognizant of the odor of stale soap that has collected out of sight by the overflow. The "Ajax" weir-fitting overflow was one that appealed strongly to me; but I should have hesitated to mention it here had it been still on the market in the name of the firm that patented it. Of course, there are other good overflows, but the weir principle, with the facility of removing the plate and exposing the overflow, appeals to my sense of cleanliness. The old-established shell-screened overflow is an abomination, harboring collections of dried soapsuds that may easily prove injurious to health. Of course, the lavatory basin waste should be provided with screw-capped cleansing traps in an accessible position, and should also have a puff-pipe (that is, anti-siphonage pipe). Stack wastepipes should also be supplemented by anti-siphonage pipes, so as to prevent the standing water from the traps being drawn out by the action of momentum and siphonage. Baths should be trapped and should have accessible overflow and puff-pipe. There should also be a dribble-pipe from the safe beneath the bath. Water-waste-preventing (commonly called flushing) cisterns should be of good construction, and, where permitted, they should be of three-gallon, instead of merely two-gallon, capacity; nor should the inlet-pipe be contracted in bore, as is not infrequently the case. Closet-pans should be self-cleaning, and should not only have a sufficient water-seal, but a fair standing water area also. Good valve apparatus closets are very commendable; but, still, I prefer the "washdown" variety of pedestal closet. Of course, the "washout" variety is adjectively unnameable, and is discredited in London, though not infrequently still to be met with in unmodernized systems. And with all or any of these systems, wooden enclosures are to be avoided, for even with the valve variety it is possible to obtain "pedestal" treatment. Baths and lavatories should also be unenclosed; let the fittings stand exposed to light and air. As regards drainage, the lines should be straight and laid to a moderate fall only; too slight a gradient means the possibility of inefficient clearance, leaving deposits, which will gradually slit more and more, and eventually choke the drain, and too steep a gradient also (curiously enough) may have a similar effect. It has been found that for 4-in. and 6-in. drainage a fall of 2 in. in 10 ft. (1 in 60 gradient) is generally effective; an increase in the pipe-diameter should be met by a decrease in gradient; but an increased diameter should only be provided where the mass of discharge justifies it. In a house where I was concerned a few years ago I found that a system of 9-in. drainage throughout was installed, and this, too, by a firm of London engineers for a property dating only thirty years back even now. I had the whole of this cleared away, substituting 4-in. and 6-in. There was also, not very far from the house, a large choked-up cesspool, not habitually used; for by means of a sluice-valve inserted in a Y-junction pipe, the discharge could be directed either to the cesspool or to the main sewer. This cesspool, too, I had cleaned out and filled in with brick rubbish and plenty of lime disinfectant. You will find it hard to credit that

my client (who had, of course, first authorized me to close the cesspool) afterwards had it re-opened by the advice of a New Zealand brother-in-law, whose New Zealand ideas are not properly transferable to suburban practice in England. As a corollary, I may add that my pliable client rarely now enjoys good health, though I cannot vouch for the connection of cause and effect. Where curves or changes of direction become necessary in a drainage system, man-holes or inspection chambers should be provided. Good pipes and good jointing are necessary. I have a preference for unsocketed pipes. Of course, all drains should be bedded on, and partially in, shallow concrete. Porous pipes and open joints are inadmissible, except for agricultural drainage and unconscientious landlords. I have come across some curious instances where the house drains, constructed of poor materials and with defective jointing, have been passed by the local authority as not being a nuisance. In this connection I might relate the following: A superintendent from the Office of Works went one day to inspect a very old house in the country. The old place smelt very badly. The inspector walked about sniffing. "What a disagreeable odor!" he said at length; "can it be the drains?" The owner shook his head positively. "It can't be the drains," he said, "because there ain't none." To me this attitude of mind is extraordinary—no, I am wrong; unfortunately, it is not extraordinary, but it is one at which to marvel. We may perhaps understand landlords demurring at the application of a hydraulic test to old drains as being "unfair" (whatever that may mean); but to think that a servant of the public, a so-called sanitary inspector, should take up the same attitude and use the same argument as to its being unfair—to think that such a one, whilst admitting frankly that the drains are probably unsound, should yet say that they were not a nuisance, as long as they were not running under the house—well, one can but suppose what one is unwilling to express. I will concede this much—that defective drains might be a matter of less urgency for replacement were they running in an open channel, exposed to the free air of heaven, for they would then be aerated. But confined underground, noxious gases are generated, which gradually permeate the surrounding soil by way of defective work and materials, and thus promote a breakdown of health. Recently I had a case of this nature, where the tenant complained of the smell and also of the rats. Despite the fact that on inspection my plumber saw a rat poking his head up from the sewer through the cleaning-eye of the disconnection trap (which was no disconnection trap, as the eye lacked a sealing-off cap); despite the fact that my plumber and I saw plentiful marks of the claws and presence of the rats; despite the fact that we could not fill the drains with water (for the latter logged the surrounding soil and poured out in the disconnection chamber at all points and places, except by way of the channel pipes); despite the fact that we saw the smoke pouring in volumes through the open joints of the soil-vent pipes—despite all these facts, the sanitary inspector (declining to use the hydraulic test as being "unfair") calmly reported that there was nothing wrong anywhere under a smoke test, merely graciously conceding that it would be well to put a sealing-cap to the eye of the disconnection trap. It was red-tape rampant, and I, too, became redly rampant in trying to induce the inspectors to refrain from submitting such an absurd report, and to show them that their heads were made of wood and their brains of wool. But all in vain! All that I would add in conclusion is that at times (I admit) drains may be very faulty and yet no injurious illness result; the way to regard matters is that so long as drains are faulty and are not exercising the functions for which they are installed (that is, to carry off in their entirety to the sewer all house discharges), a weak state of health or a predisposing state of health on the part of anyone may be converted into an infected and possibly a fatal state of health, due to the defective drains. And so, in the words of Sir Philip Sydney, I may say—

> From so ungrateful fancy
> From such a wicked frenzy,
> From them that use us thus—
> Good Lord, deliver us!

THE PREVENTION OF TUBERCULOSIS

BY J. H. ELLIOTT, M.D.

I have presumed that a paper presented to this Public Health Association should deal with prophylaxis rather than with treatment, with the disease in its general aspect rather than with the individual patient.

The question we have to discuss to-day is "What are the means by which society can deal with this disease?"

As a general hesitates to engage an opposing force unless he has some information as to their numbers and disposition, so in our attack on tuberculosis is it wise that we should have fairly accurate statistics concerning the problem with which we have to deal. This is true, whether the movement be national, provincial, or local. The Dominion census figures should soon be available and these should be of service to us in estimating whether the work already done has borne fruit, and it is to be hoped that the new Public Health Acts adopted, both in the older provinces and in our new western provinces, will, through their regulations bearing up registration of cases, give each community and province concrete information upon which to act. The value of accurate yearly statistics cannot be overestimated in dealing with the problem in hand.

There are two methods of dealing with the prevention of tuberculosis: (a) Prevention of the entrance of the bacillus into the body; (b) fortifying the body against infection if exposed, and intensifying the defensive forces of the body. Both of these methods must be used. The first demands the discovery of all "open" cases of tuberculosis and the adoption of such measures as will effectually prevent the spread of the disease to others. The second demands that every citizen be instructed in personal hygiene and that the housing question with all that this implies be given most serious attention. Of the deaths from tuberculosis in Canada, 85 per cent. are from the pulmonary form—and this is always caused by the human type of bacillus; practically all adult deaths are caused by the human type, hence the importance of dealing with the individual "open" case who is the source from whom other cases develop. We must remember the disease is never hereditary, but *always* an infection from some "open" case.

Of tuberculosis as a cause of death in children, W. H. Park has demonstrated that from six to ten per cent. is due to bovine infection and this source must also be dealt with, though it can never be considered as important as the human infection.

We must then, to be successful, locate the cases. Many methods must be employed. Physicians and householders should report all known cases. It would be ideal if the physician could deal with the well-to-do case and the municipal authority, through the Health Department, with the poor. For each case the infecting source should be sought and properly dealt with, also all contacts with this source undergo examination sufficient to decide whether infection has occurred, and this should be done also with those exposed to the reported case. In this way a surprising number of infections are at times discovered.

The infected cases must, of course, be dealt with individually, and this cannot be discussed within the limits of this paper. Speaking generally, the careful open case may remain at home under supervision with increasing degree of isolation should the disease advance. The careless case should leave home. It is especially necessary to remove children from contact with open cases.

With removal comes the question of provision of accommodation for such patients.

Diagnosis should be facilitated by each province providing, as is done by the large cities, proper containers for free examination of specimens of sputa and excreta, leaving these at every drug store, or even at every post office as suggested in a resolution passed at the last annual meeting of the Canadian Association for Prevention of Tuberculosis.

The reporting of a case should be followed by a house visit from the sanitary authority unless assured by the attending physician that this is unnecessary. The house conditions should be investigated,

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the source of infection searched for, and examination of contacts provided for—this examination not to be for gross evidences of disease, but for even slight evidences of infection.

Philip, in Edinburgh, found that in 61 per cent. of his cases positive conditions for infection were present, in another 11 per cent. probable, and in only 27 per cent. were no traces of possible infection to be found.

Newsholme has presented most convincing statistics to show that in those countries or large cities which have in past years experienced a decline in the death rate from tuberculosis, there has been an increasing percentage of institutional treated cases. In those communities where there has been only a small amount of institutional treatment of sickness or when this treatment has been defective or short in duration, there has been little or no decline in the death rate from tuberculosis. He estimates that about one-fifth of the total severe cases of phthisis in England are segregated in institutions during one-ninth of their illness. Given that the segregation is efficient and that personal infection is the principal cause of tuberculosis, this coincides very remarkably with the fact that the death rate from phthisis in England has fallen about 2 per cent. per annum since 1871.

Thus it is a fact that in England and Wales a large and increasing amount of institutional segregation has been uniformly accompanied for nearly forty years by a large and continuous decrease of disease.

There can be little doubt but that the advanced case, ill at home is the greatest source of infection. There the family are in intimate contact with the sick one, and unless extreme care is observed infection can easily occur. Even with careful instruction given, the average home will have a lower standard of precaution against infection than the average hospital and the possibility of infection is correspondingly increased. Children being very susceptible must be especially guarded in the home and rigidly excluded from the sick room.

A well-equipped and well-officered hospital offers so many advantages over the average home that there is not, as a rule, much difficulty in persuading the patient to enter for care and treatment if not far from his home. Every large municipality should provide such an institution, aided by private philanthropy. In Ontario, the building and maintenance of such a hospital is made very easy through the provincial aid which is granted under the Sanatorium Act. There is no more important step that any community can take in its efforts to combat tuberculosis, where this is associated with a municipal dispensary, which should be the central point of municipal organization against tuberculosis.

It need scarcely be said that very little can be accomplished without a system of notification.

The sanatorium for incipient cases gives segregation during a less infective period and offers possibility of cure to the early case, but is not such an important factor as the hospital in the prevention of infection.

On the other hand, we must realize that those measures which increase individual resistance to infection are highly important, especially as many of these measures lessen the possibility of contact with infective matter. The housing question must occupy an outstanding position in any preventive programme against tuberculosis. The co-operation of architects, and the adoption of proper legislation regarding dwellings of the poor, workshops, offices, lodging houses, schools, will be of service.

Tuberculosis, though an infection, is often due to faulty social conditions, decidedly so when occurring amongst the poor.

It is not to be forgotten that a large proportion of those who have tuberculosis receive their initial infection in childhood. Hence it is highly important that the growing child above all others should have a healthy environment—and that the child whose general health is such as to suggest infection, should have special care. Open air forest schools for anaemic children, well ventilated or open class-rooms for all children, supervised playgrounds, instruction in the principles of hygiene, all these are factors of importance.

Experience goes to show that the incidence of tuberculosis is practically proportionate to our neglect of hygienic living and to existing social conditions. With improved social and hygienic conditions there

will be a markedly lessened death rate. It is, perhaps, a true saying, "Every nation has the tuberculosis it deserves." We know the death rate in Canada may be materially lowered by the practical application of our present-day knowledge.

THE SCIENTIFIC MANAGEMENT OF HOUSEHOLD WORK AND WAGES

BY CONSTANCE E. HAMILTON.

I purpose calling your attention to the relation of the mistress to the maid and of her duty to her, also to make some suggestions regarding some of the difficulties with which we are only too familiar in this connection. I take it that efficiency in the maid is the first requirement on the part of the mistress who desires to manage her household scientifically. How can we arrive at such efficiency? We find that many things militate against it, and that the mistress for the most part has to trust to a hit or miss system when in search of the expert. Scarcity of labor and want of organization on the part of the mistresses are I think two of the factors in making our household management uncertain; we all do a fair amount of grumbling about our servants, but I fail to see that we have tackled the subject in a business way.

I would plead for co-operation on the part of the mistresses and think the time is ripe for them to confer together on this important subject, and to form associations for dealing with it. Out of so much varied experience good results must follow. Unfortunately, with the majority of young women, domestic service has fallen into disrepute, and a number of people still look upon it as derogatory. It behooves us to seek for the cause of this, to raise the standard of domestic labor and to place it where it should be, at the head of a woman's employment. It should essentially be a worthy profession, dealing as it does with our homes, the bases of our civilization.

We can remove one disability by competing on equal terms with the stores, factories and offices, and by making housework as attractive, if not more so, than these employments. To many young women the comfort in factory or store work lies in the sociability, the regular hours, and the fact that when work is over the girl can turn her back completely upon it and get into a new atmosphere for the time being. I plead, above all things, for a limited day for the domestic servant, under existing conditions for the ten-hour day, though I hope eventually to see an eight-hour day for all. This may require some sacrifice on the part of the mistresses at the outset, especially in such cases where only one or two servants are kept. A girl in house service is often at work or on duty for sixteen hours a day. She may not necessarily be working hard all the time, but she is in the mistress' hands so to speak all the time, and at the end of a bell wire. Are we making for good management in the household when we permit this; are we doing our duty to the community or to our nation when we put such a strain on a young woman who may be a potential mother? Our duty to the race demands that we should govern the conditions of this young woman's work so that in later years she may have the chance of becoming the mother of a sound generation.

A mistress could well arrange that during certain hours of the day her maids should be absolutely off duty, though when at work they shall be ready to give full value for their pay. With two or three maids in a house, hours might be arranged to overlap so that the mistress has always someone at hand, or in cases where only one maid is kept I do not think that the average Canadian mistress, efficient and hard-working as she usually is, would fear the hardship of a few hours of her own housework to herself or a little more time with her children. I believe that such an arrangement would tend to greater efficiency in the servant, and a more wholesome and simple life in the household. In

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this connection we would do well to enquire into the experience of those who have employed servants living outside the house, this plan works excellently in some localities and under certain conditions.

Much of the misery resulting from domestic service is, I believe, due to loneliness and the lack of homelike surroundings when work hours are over. The fact that leisure hours are mostly after dark is often productive of evil. Where it is possible, the girl should be provided with a comfortable sitting room, where she can entertain her friends, though this is by no means a perfect way of overcoming the difficulty, for a mistress naturally hesitates to pry and a maid does not always feel at home in the surroundings of her work.

I would suggest the formation of a mistresses' association, which should have various departments. One of these should be a domestic agency or registry in which all personal records could be kept, wages standardized and arranged to scale, and the workers graded according to efficiency. We might thus avoid finding ourselves giving expert's pay to the raw novice, a state of things we all know too well, and which works unfairly in every direction. This might also perhaps have the effect of settling some of the differences between mistress and maid, which are often merely temperamental, and might result in fitting the peg to the hole more frequently than hitherto.

We should also establish training schools in connection with the association and existing institutions, having long and short courses of instruction, so that even an expert cook from the old country might have the opportunity of becoming familiar with our stoves and other conditions, thus saving much friction.

Lastly, I would urge the establishment of domestic servants' clubs, with properly supervised recreation rooms, where the young woman might entertain their friends of both sexes; I do not think that it would be a very difficult matter to find out the standing of such friends and admit them according to their desirability.

Something of this kind is especially necessary in country districts. With the wider use of the school houses, social centres might readily be formed at which a lonely girl could meet others of her own kind under proper chaperonage.

The associations could give badges for long service and good conduct, which would act as incentives to excellence.

This is not all mere theorizing, for something of the sort has been tried out by the German housewives of New York, and has been found to work well. Membership of such clubs carries with it a certain social distinction and *esprit de corps* which are found to have an excellent moral effect.

I plead now that the Toronto mistresses shall follow the example of these ladies, not only for their own benefit but as a duty to those young women who form so important a part of the household, and I think that in providing the right conditions for the workers they would go a long way in the direction of scientific management and the production of efficient workers. I believe that it lies with the mistress as much as with the maid to raise this essentially worthy and feminine calling to the rank of one of the desirable professions.

THE VALUE OF A HEALTH LABORATORY TO A MUNICIPALITY

BY G. G. NASMITH, PH.D.

DIRECTOR OF THE LABORATORIES OF THE DEPARTMENT OF HEALTH, TORONTO.

The work of a Health Laboratory involves the practical application of scientific methods to the diagnosis of disease, and for the prevention of unnecessary illness and premature death. Those scientific methods, which have been shown to be of value in diagnosing disease, or which can be used to demonstrate whether water or milk, food, air or medicine, are fit or are unfit for human consumption, are those

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which have been adopted as routine methods in the average municipal health laboratory.

Much of the work which has proved of such marvellous value in conquering disease has been actually done in the Health Laboratories of the world, and practical problems will always be cropping up which will require investigation and research.

In making out a case for the Laboratory, one has naturally to draw on one's own experience for specific proofs rather than to draw general conclusions from the results obtained in other laboratories. If, therefore, this paper appears to be too local in its nature, I hope you will pardon me in the belief that perhaps our experience here may possibly serve to demonstrate our argument.

For instance, it would be impossible for any of our milk inspectors to tell from inspection whether a sample of milk contained 3 or 3½ per cent. of butter fat, or whether it contained 10 or 12 per cent. of water. The chemical analysis alone will reveal the fact as to whether the milk is skimmed or adulterated.

The water sample may appear as clear as crystal, but I would defy our bacteriologists to say from inspection whether the bacterial count was high or low, or whether B. Coli was present, by looking at it. The eye cannot see the bacteria present in water, nor would it be safe to say whether the water was infected with sewage or not. Only the bacteriological analysis in the laboratory will show whether the infection is present or not.

A physician may be in doubt as to whether a case is only common sore throat, tonsilitis, or diphtheria. He sends a culture down to the laboratory and has his diagnosis confirmed or disproved; in either case he is in a position to act quickly. After recovery, the patient is only allowed to go free when two successive negative cultures have been obtained, thus assuring the public that the patient may safely mingle with his fellows once more.

Throughout the city, at intervals of approximately half-a-mile, and usually upon a car-line, we have 50 "Culture Stations." These stations are drugstores, in which we have made arrangements to keep a stock of outfits, which are supplied by us for taking specimens to be examined for tuberculosis, gonorrhœa, typhoid, or diphtheria. The druggists are paid five cents for each outfit taken out by a physician, and when the specimens are returned they are sent down to the laboratory before five o'clock, at the expense of the department. Physicians, or messengers at the physicians' expense, may send diphtheria cultures down to the laboratory up to 11 o'clock at night, the culture being placed in the incubator by the night watchman. The laboratory, on Sundays and holidays, receives specimens for examination, but only diphtheria is reported on these days; the work of the laboratory is carried on during 365 days of the year in order that not even one day may be lost to the physician.

The value of the tuberculosis diagnosis has proved useful to ourselves as well as to physicians in this way.

During the past year, 187 positive cases of tuberculous diagnosed in the laboratory have been reported to the Supervisor of the Tuberculosis Nurses' Division. It was difficult early in our tuberculosis campaign to get physicians to report cases of tuberculosis. It had never been done before, and they did not quite understand why we wanted it. When a positive sputum comes to the laboratory now, the name and address of the patient, with that of the physician, is sent to the Tuberculosis Division. The Supervisor of the division calls up the physician and asks him if the city nurses could be of any service in the case; whether the house needs disinfection; whether there is need of actual nursing, or whether there is only need of supervision and education of the patient as to the danger of infecting other members of the family. In most cases the physician has been glad of our co-operation in some form or other; he himself learns of the work the department is trying to accomplish, and of its anxiety to co-operate with him, with the result that many people are being aided by our nurses, not only to help themselves and learn how to get well if possible, but also how to keep others from contracting the disease.

Infection of the eyes of children with the germ which causes gonorrhœa is responsible for about one-third of all cases of total blindness in America; there are 60,-

000 blind in the United States, and 20,000 of these were due to this preventable cause. The saying that a child was blind from its birth is only too frequently true, because the infection in such cases occurs from the mother at the time of birth. The value of determining absolutely by the laboratory method as to whether this disease does or does not exist in either parent is, therefore, very evident, particularly under such circumstances, and, as one can readily imagine, under many others.

The Widal reaction, which occurs in many typical cases of typhoid fever, is also of value in excluding other diseases which show symptoms or complications somewhat similar to typhoid fever. If the patient has not typhoid, the reaction does not usually occur. The reaction is only of value when found, but when absent it is of no significance. The laboratory is practically the only means of controlling this disease in a city. Typhoid is a filth disease pure and simple, and contracted solely from taking into the system the typhoid bacilli excreted by others, either with the disease or carriers of the bacilli. The problems of sewage disposal and the purification of the water supply can only be controlled by the laboratory examinations. In fact, it is the one method of determining whether water is or is not contaminated, and where purification methods are in use, of what value they are.

Any method of water purification requires constant checking by bacteriological methods, to determine the efficiency of the system, and to keep a check on those operating the system. If the water supply is impure the laboratory alone will give the warning signal, and if constantly or intermittently infected, the danger signals are sent out from it.

In Toronto, for instance, our water is at present both filtered and chlorinated. The filtered water has, as a rule, 97 per cent. of the bacteria removed; the chlorine finishes most of those left. In cases where there may be 100,000 bacteria per c.c. in the raw lake water, and 97 per cent. of these are removed, it means that there will be 3,000 still in the filtrate, which may be quite dangerous drinking water. A small amount of chlorine, .2 to .3 parts in a million, will, when properly applied, invariably destroy most of the organisms left, and render it safe at all times.

In 1911, when we were endeavoring to find whether it would be possible to take pure water anywhere within ten miles of Toronto without treatment, we found by careful series of experiments that there was no such place. At the same time we obtained much valuable data, showing that sewage currents flowed in any direction in the lake, the direction depending on the wind to a large extent. We showed the presence of sewage contaminated water ten miles either way from Toronto, at depths down to 100 feet, and concluded that under present conditions Lake Ontario water was never safe without some form of treatment.

From the practical standpoint it put an end to the agitation for the extension of the intake pipe into 100 or 125 feet of water, settled the dispute as to the purity of the water in the lake, and saved much money to the City of Toronto.

These currents in the lake had a very important bearing on the question of typhoid, originating from an unsuspected quarter. Our careful following up of typhoid cases instituted in August, 1911, revealed the fact that 13 cases of typhoid in the month were members of the crews of seven passenger boats. Examinations of the water supplies on these boats showed that they all pumped drinking water anywhere and everywhere in the lake, and as a result they had all occasionally picked up contaminated streaks of water in the lake. We took the matter up with these steamship companies, with the result that duplicate water systems were installed on the boats, with tanks sufficiently large to carry city water until they were five miles out into the lake. They were allowed also to fill these tanks from the middle half of the lake and have, as a matter of fact, issued strict regulations and lived up to our requirements very well. If there were cases of typhoid on these boats this year they were not put off at Toronto, for we have only a record of one case from them. The record of 46 cases in August, 1911, as against 116 in August, 1912, testifies to the value of this agitation and work regarding typhoid. The laboratory examinations made demonstrated these sources of infec-

tion, and made it possible to have them corrected.

In addition to these two principal features many wells and springs have been examined and closed, because they were found to be unsafe. The greater care exercised in regard to the inspection of the milk supply has also doubtless helped to materially lower our typhoid rate.

The value of the laboratory was also shown during the summer of 1911, when it was found that about one-half the bottled waters purchased in the open market showed the presence of B. Coli. The facts published showed the public that, though it had been buying such waters in the firm belief that they were perfectly pure, they were as a matter of fact no safer than the water from the city mains.

In 1910, before any precautions were taken, or laboratory established, the death rate from typhoid in Toronto was 45 per 100,000. In 1911 the rate was 20 per 100,000. This year to date—and we have passed the worst month—the rate has been only 7.5 per 100,000. Suppose it is higher than this, say, 12 per 100,000. This means that in 425,000 of a population there will have been $(45—12) \times 4=132$ deaths saved annually from this disease, which at $4,000 per life means an annual saving of $528,000—besides the tremendous conservation of earning power.

This year to date we have had 172 cases of typhoid fever in Toronto, of which 42 have contracted the disease from outside sources, leaving 130 cases to Toronto.

During the past year in Ontario we have had evidence of the lack of a proper supervision of the water supply in two notable outbreaks of typhoid fever—at Sarnia and at Ottawa. In the latter case they had a laboratory, and no appropriation to run it. At Sarnia they had no laboratory, nor from the size of the town could they be expected to maintain one. They had, however, had frequent analyses made of their town water by the Provincial Health Laboratory, and had been warned that it was dangerous. Because no precautions were taken there was an outbreak of typhoid, which resulted in a death rate of 140 per 100,000 population. Since anything about 20 per 100,000 is looked upon as probably due to water, one can readily see how severe the epidemic was.

Ottawa City is just recovering from an epidemic which is now being thoroughly investigated. About 18 months ago they had a similar epidemic of about the same size. The second epidemic would not have occurred if there had been a constant supervision of the water supply by an efficient laboratory. It would have been soon noticed that the chlorine was, for some reason, not proving efficient, even in the very large quantities used, and steps would have been taken to avert the trouble, or warn the public to take every precaution.

A year ago it was thought by some that our milk supply was beyond question, though the sky-blue color of the material served out in some of the lunch counters must have caused secret suspicions in the minds of patrons that the city taps had been called into requisition. Investigation in the laboratory showed that our milk supply, to say the least, was in general watered, skimmed, dirty, and in some cases treated with preservatives.

As a result of persistent action in getting after the dealers, based chiefly upon the analyses made, the milk supply has been improved from one which was 40 per cent. below the legal standard, to one which is now on the average ½ of one per cent. above the legal standard in butter fat, and in point of cleanliness, bacteria count, and so forth, it has been vastly improved and will continue to be so.

Based on the amount of water added to the milk, we worked out the actual cost of the water which Toronto people were buying annually, believing it to be milk. At the current price of 9 cents a quart, the amount of water which we were able to eliminate in a year amounted to just about $300,000. In other words, Toronto people had been expending annually $300,000 on water at 9 cents a quart, believing they were buying milk.

The danger from milk is peculiarly great, because bacteria, like diphtheria and typhoid, will grow in it. We, therefore, are insisting that all cans be washed, sterilized and sealed in the city before returning to the farmer, so that if any way the milk has been infected in the city, none of the germs will be sent back to reinoculate a fresh supply of milk. It is for this reason also that the Department of Health approves of the pasteurization of

milk after it has reached the dairy, in order that disease-producing germs, which may possibly have got into the milk at the farm, will be destroyed, and thus render the milk absolutely safe, even if tubercle bacilli from tuberculous cattle had been originally present.

Mr. John Ross Robertson, by the installation of a pasteurizing plant in the Sick Childrens Hospital, has been able to eliminate all intestinal disorders of the children in the hospital.

The efficiency of all of the methods used in handling milk is kept track of by frequent bacteriological analyses in the laboratory.

The ice supplies of the city are also examined in the laboratory before the ice is harvested, to determine whether they are safe to use for domestic purposes. Ice is infinitely purer than the water from which it has been derived, the process of freezing apparently squeezing out all foreign matter, including bacteria. We do not consider the danger from this source as important as our water or milk supply, but it is a bad practice to allow ice from polluted sources to be used except for cooling purposes, and we only allow this when bonds have been given that it will be used for this purpose only.

The laboratory may prove of great value also in keeping check of the food supply and the air supply.

The question of the air supply came up last winter, when the Director of the Laboratory was summoned to court to give evidence in the trial of the City versus the Toronto Railway Company re danger of overcrowded street cars. The evidence given showed that the danger of infection was infinitely greater the closer people were jammed together, and that, for instance, when a man coughed in anothers face at a distance of six inches, he would get an infinitely greater number of germs on his face and probably in his nose and throat than he would if the offending party were three feet away. The writer was able to demonstrate this graphically to the court by means of a series of gelatin plates which had been held at various distances from the mouth when sneezing or coughing and showed the comparative number of colonies which developed at the different distances. The evidence was sufficiently strong for the judge to send the jury back again to bring in a verdict on the health question at least, though it even then refused to do so.

This summer there have been in Toronto three fairly well defined small epidemics of dysentery or colitis, involving in all about 33 cases, but with 14 deaths. All children under three years of age infected died. On investigation, no common factor could be found. In general, the surroundings of the people in which the cases occurred were unsanitary and flies were abundant. Ice cream figured rather largely also in many of the cases, but as this was derived from several sources, nothing specific was obtainable. However, it was of sufficient importance to merit investigation, and the ice cream and cream supplies of the city were investigated, from the bacterial standpoint.

We know in general that the bacteria content of cream and ice cream in general is infinitely greater than the milk from which it is derived. The information which we have already obtained is sufficient justification for us to demand that hereafter all cream, whether used for ice cream or not, be thoroughly pasteurized, so that the danger from this source will be eliminated. When required for whipping purposes, saccharate of lime may be used to facilitate the whipping power lost by pasteurization.

The laboratory, as I have endeavored to show, from the standpoint of dollars and cents, is a most economical institution to a municipality, provided that the knowledge obtained by laboratory methods is applied to the practical solution of the problems involved. It is, obviously, useless to accumulate all sorts of data in a municipal laboratory in regard to problems requiring solution, and never use it as a means of solving those problems. Where there are practical problems to solve, there should be little time for academic work. This is the viewpoint, at least, we take of it in Toronto. Our laboratory is, perhaps, run on rather unusual lines. Our staff are qualified men, who not only do the actual work in the laboratory, but they go out and take samples, make investigations, and generally try to get first-hand a complete grasp of the problems they are working at.

Our chemist, a University graduate, who now has charge of the milk problem, has visited all of the dairies in the city, knows them first-hand, and is getting the practical side of the problem. The first assistant in the laboratory has recently been appointed Epidemiologist to the city, a position that is intimately connected with his work in bacteriology.

The laboratories at the island filtration plant have just been turned over to us, it being considered by the Works Department that since we were responsible for the quality of the water anyway, we should have charge of the technical work of testing the efficiency of the filters.

An experimental plant to get scientific data as to the most desirable and economical methods of satisfactorily treating our sewage is now under construction, designed, and to be operated by the laboratory staff. Until our sewage is finally treated by some biological process we are building two chlorinating plants to chlorinate the sewage and destroy the great majority of pathogenic organisms before sedimentation, and before the effluent passes into the lake. These also will be operated from the laboratory, and controlled as to their efficiency.

And finally, the laboratory is responsible for writing and editing the monthly bulletin of the Department of Health.

Fortunately, in Toronto we did not have to cope with precedents and departments already established. Until two years ago, the city laboratory only examined diphtheria swabs and water specimens from the tap. Many problems had never even been touched, and it was the simplest possible way to attack those requiring technical methods for their solution by the laboratory men. In this way, perhaps, our laboratory has a broader scope, and is operated on a different basis to any other municipal health laboratory. And even if we have not always been able to accomplish what we had hoped, the records show that along certain lines at least improvements have been made and both money and life conserved.

The saving of life and the prevention of unnecessary illness, and its accompaniments of destitution and misery, is the great function of a health department. The most important agency of a health department is an adequately equipped laboratory, simply because very many of the most important problems of a health department are ones requiring the application of scientific methods for their solution.

How any municipality in a modern city can get along without a laboratory to check these various problems, it is difficult to see. When it does get along without one, it is simply an indication that the people in that municipality are not being protected from fraud and disease, and that the conservation of human life is not being considered.

Has any municipality any consideration of greater importance than that of its citizens of the right to live? And when it does not protect them from preventable diseases, it takes from them this unalienable right which every human being possesses.

The greatest thing in the world is humanity. The most valuable asset to a nation is the health of the people of that nation, and even from the standpoint of dollars and cents, it is the greatest economy to conserve life and health just as it is the worst kind of folly and extravagance to waste it.

THE INTERNATIONAL HYGIENE EXHIBITION OF DRESDEN, GERMANY

BY J. F. HONSBERGER, M.D.

The subject allotted to me, "The International Hygiene Exhibition," is one so extensive in its scope, that with the short time at my disposal, I fear I shall utterly fail to do it justice.

It is said that "to see is to believe," and with the brief outline of a few of its outstanding features, to which I must of necessity confine my remarks, only the faintest conception may be formed of the mag-

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nitude of this world-famed "Aus-stellung."

Never in the world's history has such an exhibition, of like character and dimensions, been attempted, much less brought to a successful termination.

The idea originated in the minds of the medical profession of Germany, some seven or eight years ago, and after years of ardent toil, and extreme anxiety, it culminated in an exhibition greater and better than had been anticipated, by even its most sanguine promoters, and it is probable that many generations may pass away, before another of like proportions is attempted.

Held in Dresden, the capital of the little kingdom of Saxony, a city classical in character, the home of music and culture, renowned even on the continent, where great and beautiful cities are abundant, for its picturesque location, magnificent parks and public buildings, but much more for its famous, and world renowned galleries of paintings and sculpture.

A portion of the "Grosser Garten," one of the beautiful parks of the city, some three hundred acres in extent, was loaned to the committee, and by them transformed into a veritable city of palaces, of immense proportion and classical architecture.

The buildings necessary to contain the exhibits gathered from the four ends of the earth, covered at least twenty-five or thirty acres.

The exhibition, while originally intended for the great Empire of the Kaiser, became international in character, and was participated in by nearly every nation of Europe, together with Great Britain and Canada, Japan and China, Brazil and the Islands of the Sea, the United States by their absence being a conspicuous exception.

It was formally opened to the public early in May, 1911, and remained open, Sundays and week days, until the middle of October, and was visited during that period by at least two millions of people, the daily attendance being from fifteen to twenty-five thousand.

The term hygiene as applied to the exhibition was used in its broadest sense, and included all matters pertaining to the health of the people, and the conservation of human life. It was not intended to be of a competitive nature, and yet each nation strove in a friendly spirit of rivalry to present their claims to distinction to the very best advantage.

An important feature was the holding of no less than three hundred separate congresses, or conventions on subjects akin to hygiene, in which not only leading professional men, but laymen of three continents took part, and great and lasting good must result from the interchange of opinions and comparisons of results achieved.

The exhibition was divided into four sections: 1st. Scientific; 2nd. Historical; 3rd. Commercial; 4th. Sports.

The main building, called "Der Mensch," although scientific in character, was, owing to its practical nature, of great interest to the general public.

Here, by means of models of novel and modern type, aided by electrical appliances, the anatomy of man was shown.

Physiology, the hand-maid of anatomy, formed an important feature—the physiological effects of foods, dress, exercise, climate, fresh air, alcohol, housing, etc., were portrayed in a very practical manner.

The ravages of alcohol on the human system was vividly impressed on the minds of visitors by practical demonstrations of the physical and commercial waste pertaining to the drink habit.

Heredity, embryology and sociology formed interesting features.

Great stress was laid upon "Infant Mortality," a large department being entirely devoted to the subject, presided over by a nurse, where the care of the infant, its food, clothing, habits, and amusements were exemplified in a practical manner.

Prominence was given to industrial hygiene, the effect of unhealthy trades, dust, dirt, stone dust, pollen from flowers, metallic poisoning, noxious gases, and dangers attendant on machinery of various kinds, and electrical appliances, unsanitary factories.

Contagious diseases, their cause, prevention and cure, the almost specific value of vaccine and serum, in their cure and prevention, were convincingly demonstrated.

Venereal disease, and the social evil, occupied a separate department, presided over by a lady. Here, by means of wax models, and pathological specimens in great numbers, syphilis and its accompanying

diseases were shown in all their terrible forms.

One of the greatest problems which Germany has at present to face is the suppression of vice. The beautiful and cleanly city of Berlin is said to have more dissolute women, in proportion to its population, than either London or Paris.

Congresses are held, and various methods adopted, but the evil in all its forms still flourishes.

Segregation is in force in Dresden, and a model of its restricted area, and method of regulation, registration and inspection was exhibited.

The object in placing this matter so conspicuously before the public was that it might serve as a warning to the innocent and those ignorant of the disease and its disastrous results.

This department was visited by thousands each day.

In the historical section, the history of hygiene was exemplified by practical illustrations, and its progress traced from the early ages to the present time.

Here man was seen, as he lived in primitive times. The wild man of the jungle, the Laplander with clothing of skins, and teams of reindeer, the cave-dweller—tree-dwellers, as well as the North American Indian, and the negro from Central Africa, all depicted with their families, living in their respective dwellings, clothed with the meagre covering made by their own hands, their only means of sustenance being the fruits of the trees of the forest, and the spoils of their bow and arrow.

Imagine, if you can, the gradual evolution of hygiene in all its phases, from this dark age of the world's history, as age succeeded age, and century followed century, until it reached the high standard of our present civilization, morals and education. Contrast, for instance, the modest attire of our first parents, with that of our modern lady or gentleman, the humble hut of the aborigines, with a modern dwelling, his method of earning a livelihood with the present industrial life, his mode of communication and transportation, with that now in vogue, and one is lost in astonishment at the marvellous change.

In sanitary science, a striking illustration was given by placing side by side a model of a Chinese city, and the modern city of Liverpool, the former with its narrow winding streets, the rear of the dwellings facing the street, which were dark and dirty, open drains which received the refuse, the housewife emptying the waste of the kitchen, and the nightsoil of the family into the street, hogs, dogs and other animals, lean and lousy, obtaining their scanty living from this source.

Public wells, into which the surface water of the street finds its way. Lavatories only, such as are provided by erecting a board seat over an open drain or trench at the crossing of the street, and exposed to a full view of the pedestrians.

Compare with this the beautiful city of Liverpool, now undergoing a transformation at the hands of a Commission on Town Planning, with its wide and spacious avenues, lined by shade trees, beautiful parks and gardens, sanitary homes with all modern conveniences; sewerage system, electric light, gas and water supply; schools, churches and colleges, homes for the unfortunate and destitute, and you have a practical illustration of the cause and cure of pestilence, plague and disease.

The practical side of hygiene was shown in the commercial section, where all advances that modern invention and scientific knowledge has suggested, were put into practical form—the hygiene of home, and schools and colleges, streets and public buildings, hospitals, jails and asylums, railways.

All requirements for disinfection, in homes, railway carriages, etc., a tunnel into which the latter might be drawn for disinfection—a railway coach, equipped as a hospital, with beds, dressings, drugs and instruments, operating room, with nurse and physicians in charge, sewerage systems, water supply and purification, gas and electric appliances.

In the field of sports, every opportunity was accorded for amusement and recreation, and practical demonstrations were given in all forms of athletics, swimming, etc.

I cannot conclude without briefly enunciating a few of the prominent features, for which several of the countries deserve special mention.

Austro-Hungary, where swine-pest is very prevalent, has discovered a vaccine which renders man immune from the disease.

Japan's military hygiene, as practised in the Russia-Japanese war, was particularly good, and received much favorable comment, whilst her school hygiene, embracing medical inspection, open air schools, the weighing and measuring of school children twice yearly, was a splendid feature.

Switzerland excels in the care and instruction of children, and the ventilation and sanitary condition of tunnels, of which it has more than any other nation.

France justly prides herself in the work of Pasteur, and has immortalized his name by a public institution of great reputation.

China, not so progressive as her neighbor, is devoting considerable attention to the food of her people, and is imitating other nations in other matters of sanitation.

Brazil, where poisonous reptiles abound, has produced a serum for each variety, with splendid results, and a very much lessened death rate from that cause.

Yellow fever, too, by the adoption of hygienic methods and sanitation, the number of deaths has been reduced from fifty-four in 1900 to two in 1909.

Russia and Austria have made considerable progress in factory conditions, a celebrated cigar factory in Austria having reading rooms, rest rooms, restaurant and nursery.

Great Britain excelled all others in research work of diseases peculiar to her colonies, as well as cancer research.

Specialists have been sent to Africa and India, for the sole purpose of research, to combat cholera, the sleeping sickness and Bubonic plague.

Tuberculosis, too, is being vigorously attacked, and in Great London, where all adverse conditions formerly obtained, through the efforts of the health authorities the death rate from this disease has been reduced to eighteen per 10,000 of population, whilst that of Berlin is twenty-six, St. Petersburg forty-four, and Moscow forty-six.

The results of town planning in Liverpool, too, is a remarkable record, followed closely, however, by Berlin, Germany.

Germany excels in the cleanliness and sanitary condition of its cities, safety of travel, and conservation of the lives of its artisans and laborers.

Only recently has the manufacture of sanitary supplies been taken up here, nearly all having, heretofore, been imported from the United States and England.

Canada made but one exhibit, that of its Quarantine Station at Grosse Isle, Quebec, and in this and its quarantine regulations it had no serious competitor. Japan, Russia and Germany have systems of their own, but as the immigration into those countries is very limited, little effort is required, excepting such as is adopted to ensure the safety of the great German steamship lines sailing between her ports and other countries. Visitors generally marvelled at the wonderful strides Canada is making in nation-building, and it was predicted that she would ere long become not only a leading colony of Great Britain but the very centre of that Empire.

In conclusion allow me to suggest, in view of what I saw at the exhibition, the lines along which we in Canada ought to increase our activity.

1. In view of the report of the British Commission on Tuberculosis—disproving the statement of Dr. Koch "that tuberculosis of cows could not be transmitted to human beings by means of the milk"—all cows furnishing milk for human consumption should be inspected twice a year.

2. Meat inspection by competent veterinaries in all cities and towns.

3. The establishment of tubercular sanitaria in every county or group of counties, compulsory notification.

4. Greater attention to the hygiene of schools, medical inspection, now in vogue in a few large cities, extended to all schools.

5. Town planning—every incorporated town to have a commission, with power to regulate the building of houses, streets, etc., in order to avoid overcrowding and other undesirable conditions.

6. Greatly increased attention to industrial hygiene, safe-guarding the lives of workmen in factories, by guarding dangerous machinery, elevators, etc; endeavoring to reduce the frightful loss of life in our railway service by guarding all level crossings and enforcing rigidly all rules of travel made for the safety of passengers and employees.

PERIODICAL OPINION

Free Mothers for a Free Race.

It is the instinctive motherhood of woman that has strengthened the cause of suffrage. For when that motherhood, *The North American* well points out, was brought to realize the evils that beset the children of men, evils which could be largely restricted, if not totally abolished, by political action, woman began to demand the right to vote. She did not want that right merely through vanity or as an avenue to a diverting avocation. She wanted it that she might write into the laws of the people the gospel of humanity. She wanted the ballot that she might protect herself from the injustice and brutality that preyed upon defenseless women. She wanted it to protect her children from the greed that fattens on the slow death of the innocent.

When woman had no children of her own, her instinctive motherhood sought to protect the children of others less capable of offering resistance to aggressive privilege.

For years they struggled to help the lowly and oppressed. They found their best efforts virtually nullified by social and industrial conditions over which they had no control. The tired, overworked, underpaid, lonely girl was a tremendous problem —social, industrial, moral. The worn-out mother, giving her days to a factory machine and her nights to pitiful struggles to keep together the travesty of a home which her husband's wages could not support, appealed to a sense of primal justice. The baby which that mother had virtually to abandon at two weeks, to return to her industrial grind, was to the woman leader a living indictment of the system which for 3600 years had eliminated the mother from the fifth commandment, where God's finger had traced the word on unchangeable stone.

The mother, who every day saw her tender daughter run the gauntlet of supervised vice on her way to school or to work, knew instinctively that if she had political power that daughter's path could be made safe.

And to the mother instinct that demanded the vote as a weapon in defence of the young was added the instinct of self-preservation. With the growth of the army of women in industries, the army of suffragists grew. Women who saw their sisters burned to death in firetrap factories, or torn by exposed machines, or slowly poisoned by insanitary working conditions, felt that their own health and lives depended on the influence they could exercise in government for the removal of the murderous conditions maintained by greed and indifference.

And the great questions of municipal housekeeping, clean streets, pure water, sanitary houses in which to live, clean milk, honest foods thrust themselves upon the notice of woman as matters vitally affecting her happiness and the life and health of her children.

When once woman began to understand how closely her welfare was associated with government, her demand for an equal voice in that government was inevitable. In this country her appeal was obvious. She summarized all her reasons for political emancipation in the one broad proposition of democracy. If America was to live up to its ideal, it could not continue to disfranchise half its population by a mere physical disability founded on the accident of sex. If it hoped to reach its highest development, it could not afford forever to class the mothers of its men with lunatics, felons, idiots and Indians untaxed.

Within the year woman suffrage has made notable advances. The four great states of Oregon, Arizona, Kansas and Michigan have voted to bestow full enfranchisement on woman. The women of Washington and California have, in their first use of the ballot, given remarkable examples of political efficiency.

The opposition to woman suffrage has begun full retreat. It now confesses that all it can hope to do is to delay the movement. Woman's emancipation is eventually certain.

But it is our belief that, after all, the most potent argument for woman suffrage is not to be found in her aptitude for political housekeeping, nor in her instinct for righteousness on public questions, nor in her unerring love for social and industrial justice. In the long run it is possible that men might work out these problems without her aid.

But no nation can ever be really free if the women who give it is men are not free. The mother is the matrix of the race. The old idea of servility for woman, the system that relegated her to a secondary place and made her feel almost as a matter of religion that she was a subject creature left its stamp on the men she bore.

Free women will give us free men. Strong, brave, high-minded, self-reliant mothers will put those marks upon their sons. These qualities are to be gained at no sacrifice of feminine charm and mere goodness, but are to be an added grace of womankind.

And the day when woman takes her place as the equal of man will mark an epoch in the history of the human race. It will be the beginning of the time when free woman will be nature's assurance that this nation will be a nation of free men.

Cultivating Health.

There is persistent search for specific remedies for all sorts of diseases, and it is not to be discouraged. But the greater idea should not be lost sight of, and that is to live clean, pure, positive, wholesome lives in the first place. There is preventive medicine which is much praised, but there is preventive living also. Keep healthy is the best medical advice one can get. To follow this advice one must acquire temperate habits, eat pure and wholesome food, take out-of-door exercise, think clean thoughts, do useful work, maintain a happy hopeful temper.

The *Ohio State Journal* asks its readers to pursue this sort of a life.

Stop thinking disease. Act like a well man. Don't try to find something the matter with you. Don't be an invalid if you can possibly avoid it. Read books of nature. Get on the side of beautiful facts and ideas. Stop reading about crimes and diseases. Act healthy and talk healthy; and you will not be peering around for specifics.

People often allow the imagination to concoct maladies. Down with suspicion. Fight every distemper with clean, upright, faithful lives and ten to one you will forget all about specifics and lurking distempers. Health is more natural than disease, a proposition that can be sustained by every clean, hopeful, positive life.

Taxing Light.

Although the proposal to tax various methods of lighting has raised a storm of protest from the public and manufacturers concerned in the lighting industry of France, a Commission has been appointed to draw up a definite scheme for such taxation. The committee is composed of nine officials (representing the fiscal element), four industrial representatives, and two economists deputed to safeguard the interests of the public. The government representatives are in strong majority; *L'Industrie Electrique* fears that the views of the minority will be of little weight in determining the issue.

In view of the enormous hygienic importance of most liberal lighting, energy and apparatus for the production and application of light should be placed at the disposal of all at, as nearly as possible, the cost of their wholesale manufacture, and in resisting any taxation or other legislative measures which oppose the realization of this aim, lighting engineers, manufacturers and consumers must co-operate, sinking for the nonce technical and commercial rivalry.

True national finance should relieve taxation on articles of necessity or beneficial effect, while surcharging luxuries and injurious commodities. Energy or materials for the production of light, and the necessary apparatus for the utilization of the latter, certainly come within the first category. Natural lighting is a free gift which has, by our evolution, become imperatively necessary to us. Good artificial lighting is almost equally indispensable, and should be as nearly free as man can make it.

Reported Tuberculosis Cure.

Under the heading "Newspaper Cures" the *Lancet Clinic*, a leading Cincinnati

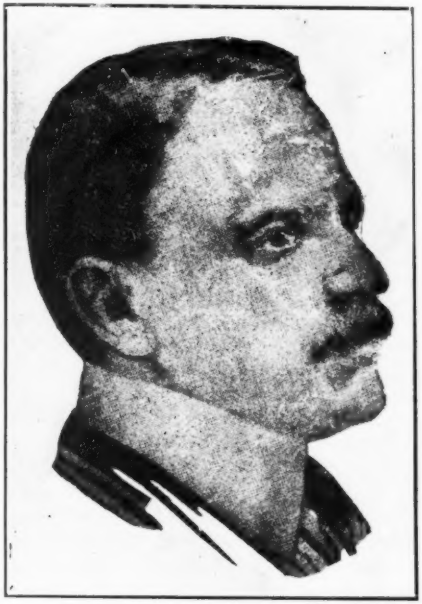
journal for physicians and surgeons brands the recent publication referring to the discovery of a cure for tuberculosis by Dr. Friedrich Franz Friedman of Berlin as a "cold-blooded cruelty." Dr. Friedman's photograph is published on this page. The article in part is as follows:

It appears that we have another cure from Berlin. This time it is a cure for tuberculosis. It seems that several weeks ago a cretain Dr. Friedrich Franz Friedman "astounded German physicians by declaring in a public conference" (whatever that may be) "that he had been successfully treating tuberculosis for the last two years, and that now he has nearly 600 cured cases to display to scientists."

Thereupon a certain American newspaper syndicate sent its European correspondent to investigate. The syndicate states that its correspondent is a "trained investigator," though it fails to state in what line of investigation he has been trained. As his name carries no scholastic degree, it is fair to presume that he has not been trained in pathological or therapeutical investigations. The investigator states that "many of the most scientific Germans admit Friedman has discovered the long-sought cure," but their names are not given.

"Several hospitals in Germany are now turning their tuberculosis cases over to him," but the names of the hospitals are not given. "Scientists from America, Australia, England and other corners of the earth are hurrying to Berlin to investigate." It is to be hoped so, and yet they have undertaken this long and arduous journey on very meager information unless they have more than we have. "Appeals for treatment by letter and telegram overwhelm the young doctor." This must be very satisfactory—to the doctor.

"The treatment is very simple. It is a serum." This sounds very well, for we have serums for so many things nowadays. But the serum is from a turtle. This is very gratifying, for it shows that Dr. Friedman has succeeded where so many earnest men have failed. Another gratifying fact is that the doctor has "produced enough of the culture to supply the world for all time." This being the case, patients need not hurry to Berlin for fear that if they do not arrive within a few



weeks the supply will have been exhausted by the treatment of the multitudes who may have preceded them. Also, the whole order of testudinata may disappear from off the surface of the earth by cataclysm or otherwise and it will not matter, for Dr. Friedman has enough of the cure "for all time to come."

But it appears that we must possess our souls in patience—that the American consumptive must continue to harbor his bacilli tuberculosis yet a little while. Dr. Friedman intends for the present to treat all cases in Berlin personally, and, the correspondent adds:

"The truth of the matter is that Dr. Friedman is trying to sift out one reliable offer for the 'American rights' from a flood of telegraphic proposals from the United States, and the doctor hesitates to discuss the question of 'American rights over the cable.' If this latter statement has any more truth in it than the rest of the dispatch we can well guess what it is that is telegraphing for 'American rights.'

"But the correspondent, the author of the cable message, declares himself convinced of the validity of the claim for cure," the *Lancet-Clinic* continues, "and if those newspaper managers who per-

mitted a story like this under scare heads are not well enough educated and intelligent enough to judge this story on its merits, and estimate the effect it would have on thousands of their fellow citizens, why, then, God help the newspaper press and the public that is served by it."

It is just possible that the *Lancet-Clinic* may be a little too sevre in this criticism.

How Health Can Be "Bought."

"Community health is purchaseable," says the *Bulletin of the Health Department* of the city of Chicago. Adequate spending of money will produce conditions that result in public health. In proof of its assertion the department cites the example of Panama.

Prior to American control of the Canal Zone the canal employes died at the rate of 241 per 1000 each year. Under American rule the great ditch has been nearly completed with a death rate among those who built it of only 11.4 per 1,000. In justice to the French it must be said that the science of sanitation was not so well developed when they tried to build the canal as it has been since.

Without sanitation there would be no Panama Canal. And what has been done at Panama can be done anywhere by intelligent but firm control. Yet American cities spend comparatively little for public health. They ought to spend much more, and they will do so when it becomes generally realized that public health, priceless as it is as a possession can be bought.

New Suggestions in Bacteria Identification.

The *Transcript Clinic* makes reference to some experiments by Dr. John W. Churchman of Johns Hopkins University, a series of investigations that opens new suggestions in the matter of the identification of bacteria. There occur many forms of these low botanical products that so closely resemble one another that separation into species is out of the question merely with the microscope. It has been customary, therefore, to test in other ways the qualities of the bacteria and a number of standards have been adopted as aids to identification. The production of gas and the manner in which the organisms are affected by certain standard stains will determine between forms resembling one another closely; and now Dr. Churchman comes forward with the first presentation of the bactericidal qualities of a material as a test between closely allied forms. The work was undertaken in collaboration with W. Howard Michael of the same university.

It had been shown already, in August, that bacteria could be sharply divided into two groups according to their behavior towards gentian violet, either by first staining the organisms and setting them to grow on ordinary culture media or by growing the unstained organisms on media containing the dye. In one group the dye prevented growth and in the other there was no effect. One hundred and thirty-eight species of bacteria were tried in the earlier experiments and the suggestion of the series was that nearly allied organisms were similarly affected by the stain.

In a recent study of five nearly identical strains belonging to the B. enteritidis group, the selective quality of the stain was found to be so delicate in its nature that it distinguished constantly between the different members of the group. One was constantly inhibited in its growth and the others were not affected. Four of the strains, by the way, were furnished by the collection of the American Museum of Natural History in New York.

Factory Laws Unsportsmanlike.

This State protects, by elaborate and well-considered laws, the wild life within its boundaries. Shall we do less for our boys and girls who work in shops and factories than we do for ducks, snipe and deer? Is it sportsmanlike asks the *St Louis Republic*, to see to it that the fish in the stream has a chance for its life by prescribing the conditions under which fishing must be done, and then permit our own young people to work under factory and shop conditions that send a certain definite percentage of them straight to their graves with tuberculosis, diabetes and diseases of the throat and nose? Do we not owe human beings as much as we owe turkeys and black bass?

The reform of bad factory and office conditions depends chiefly on two things;

the positive compulsion of law and the antiseptic power of public opinion.

The concentration of public attention on the need for well-lighted and well-ventilated offices and shops will do much. But there are certain shortsighted employers who cannot see that reform of bad conditions is to their profit pecuniarily, as well as required by the fundamental decencies. Those whom we cannot convert we should be in position to scare. What are the laws under which our officials must proceed, if they proceed at all?

Public Health in Ontario.

In this paragraph, writes a departmental editor in *The Sanitary Record*, I wish to speak of the last report of the Provincial Board of Health of Ontario, and to say with regard to it that I did not much enjoy reading it. The Board itself and the officers seem to work very very hard but they apparently get very little encouragement. What was said about water supplies particularly surprised and shocked me. Typhoid fever seems to be fairly common and is in most cases traceable to water. A special report by Dr. McCullough, the Chief Officer and Secretary of the Board, on an epidemic of this disease in Ottawa makes particularly depressing reading, and the state of affairs to which he draws attention are such as certainly should not be allowed to exist in so large and important a city. Think of a city of over 90,000 population having no full-time Health Officer, taking part of its water supply from a bay into which empties a stream which is to all intents and purposes an open sewer, and having to be recommended to advise its inhabitants to boil their drinking water! That there should be, in Canada of all places, a city in such a plight is almost unbelievable. From his report Dr. McCullough is obviously much perturbed. He makes a number of valuable recommendations, many of which it should not have been necessary for an officer in his position to make, and it is to be hoped that the Board of Health, taught a lesson by the epidemic, will hasten to put them into effect.

THE MAIL AND THE MONTH

[Material for this department to appear in any month should be transmitted before the 25th of the proceeding month to *The Public Health Journal*, 43 Victoria St., Toronto, Canada.]

Domestic.

We are told of the contemplated use by Doctor W. A. Young, Toronto, Ontario, of the name *State Medicine* (in conjunction with the word sociology) on a monthly publication, first thus employed by *The Public Health Journal* and subsequently adopted in England in the same sense by the Royal Institute of Public Health. Doctor W. A. Young being widely known as perhaps the best advertisement solicitor in Canada should constitute in himself the guarantee of a successful acquaintance for such an addition to his present excellent ventures. It is understood regarding the proposed monthly that Doctor W. A. Young will parallel his current publications in regard to style of printing and the use of ninety-pound paper.

It is no uncommon thing for a city to be sued for damages for the loss of life or limb or for other personal injury, but when a city is sued for damages because of an epidemic—that's quite another matter. Just that thing has occurred in the city of Ottawa, Canada, where a number of families have demanded damages from the city, on the ground that the city officials were negligent, in that they failed to take the proper precautions against the contamination of the city's water supply, with the result that typhoid epidemic broke out.

If this Ottawa case, under Canadian law, of course, is to result in a judgment which will enlarge the responsibilities of cities to make them liable for damages in case of epidemic resulting from neglect of officials, there is going to be additional reason why every city should be mighty careful about the character and capability and trustworthiness of the officials selected. As things are now the people pay a mighty sum annually in the municipalities for nothing more than negligence as one single item in the budget of expense.

Dr. Hastings, M.H.O., Toronto, has re-

ported that with a view of preventing the recurrence of deaths from gas asphyxiation in that city, he was preparing a by-law to provide for the inspection and regulation of gas fittings. He points out that the gas supplied by the Consumers' Gas Company was above the standard and illuminating quality called for by the Government during the past five years. According to the Government analysis, at no time during the past five years had the gas contained more impurities than allowed by law. It was, therefore, useless to endeavor to improve the quality of the gas, and the only remedy to prevent gas poisoning was to stop the leaks, and that the new by-law would do.

The following is the list of officers of the Canadian Public Health Association Sections, elected for the ensuing year at the meetings of the Sections held during the Second Annual Congress:

Section of Military Hygiene.

Convenor—Major T. B. Richardson, X Field Ambulance, 128 Bloor St. W., Toronto.

Secretary—Major W. H. Delaney, A. M. C., Quebec.

Committee—Colonel G. C. Jones, G.G.H. S., D.G.M.S., Ottawa, Ont.; Lt.-Colonel J. T. Fotheringham, Toronto; Major D. B. Bentley, Sarnia, Ont.

Section of Social Workers.

No officers appointed for ensuing year.

Laboratory Section.

Convenor—C. H. Higgins, D.V.S., Ottawa, Ont.

Secretary—Campbell Laidlaw, M.D., 400 Somerset st., Ottawa, Ont.

Committee—G. H. Charlton, M.D., Regina, Sask.; Doctor Revell, Edmonton, Alta.; J. A. Amyot, M.D., Toronto, Ont.; H. W. Hill, M.D., London, Ont.

Veterinary Hygiene and Food Inspection.

Convenor—J. B. Hollingsworth, D.V.S., Ottawa, Ont.

Committee—A. R. B. Richmond, B.V.S., Toronto, Ont.; A. W. Tracey, F.R.S.I., D.V.S., Sherbrooke, P.Q.; P. B. Tustin, F.R.S.I., Winnipeg, Man.; A. J. G. Hood, M.V., Montreal, P.Q.; W. F. McDougal, B.V.S., Melville, Sask.

Section of Sanitary Engineering and Architecture.

No officers elected.

Section of Municipal Health Officers.

No officers elected.

The report of Social Workers Section recites that J. Howard Falk, general secretary of the Associated Charities of Winnipeg, spoke upon "The Prevention of Social Misery," and expressed the view that charities, well-intentioned as they might be, had done more to prevent the coming of better conditions than anything else. Mr. Falks' paper will be published in a forthcoming number of *The Public Health Journal*.

G. Frank Beer in discussing Mr. Falks' paper, said that pressure should be brought on governments to turn millions now going to enrich those who needed no money into right channels. Then it would not be necessary for ladies to tramp about collecting for homes or for health officers to beg for appropriations to make their departments efficient. By changes, new methods of taxation, by increase of inheritance taxes, he declared, communities would be enabled to meet their social responsibilities. Rev. Father Minehan declared that a benevolent despotism should teach all mothers how to care for their babes. He believed that those who drew high rent for houses whose unsanitary condition caused disease and death were guilty of manslaughter and he advocated the use of the cudgel in the early stages of inebriates. Rabbi Jacobs as a dictator, would compel wealthy men to contribute more liberally to social reform. Mr. Lee, secretary of the immigration department of the Y.M.C.A. at Quebec, would establish employment bureaus for the distribution of casual labor, and Mr. Smith, general supervisor of Toronto playgrounds, would bring smiles to sad faces and light in dark places in order that men and women might not lose the spirit of play and become nervous wrecks.

Dr. Thurston read a valuable paper on "The Dentist as a Social Worker."

"The Scientific Management of Household Work and Workers" proved a most interesting topic and the large audience remained to the close of a somewhat long session. Mrs. L. A. Hamilton, Lorne Park, whose paper appears in this number, said that much of the misery in domestic service was due to loneliness and that the maid

should have a comfortable sitting room in which to entertain her friends. She also favored the formation of a Mistress' Association to standardize wages and of domestic service clubs with supervised recreation grounds. Miss Yates, of the McDonald College, Guelph, said that many servants were required to work in unsanitary kitchens with evil-smelling refrigerators. Dr. T. F. McMahon and Rev. Daniel Strachan were pleased to hear pleas for greater leisure for domestics, and Prof. Stevenson wished that the classes in the domestic science course at the University of Toronto were open in the evening, that domestic servants might attend. He also described an advertisement which would at once bring seven or eight really good maids to apply for a vacant place. The convenor, Dr. Helen MacMurchy, said a word from the mistress' point of view; the discussion then closed.

No election of officers for this section took place, as it was decided that the new President and the new Local Executive should be the persons to nominate a Convenor.

The laboratory section was called to order by Dr. J. A. Amyot, who gave an address on the problems before laboratory men. He intimated that two points were very pertinent at the present time, namely: the longivity of pathogenic organisms and the characteristics of the resistant minority.

Are these resistant forms virulent? To determine the point, experiments have been conducted in his laboratory with celloidin capsules. It has been stated by some that when in capsules, the bacteria pass through the capsule and are lost; others hold that the bacteria are under special conditions. His experiments were conducted with the typhoid organism reproducing as nearly as possible those which simulate the normal. Capsules were made that would hold the bacteria and allow dialysis to take place. It has been possible to make capsules that will hold the bacteria for three months, and it has been found by Dr. Brown that the typhoid organisms were alive at the end of five weeks. The organism used was secured from Dr. Hill, of London, Ont., having been isolated by Dr. Theobold Smith and known as Typhoid H.

Another point arising from the statements made last year relative to the "huskys" is: "Are they virulent?" Dr. Schofield has conducted some work in this connection and finds that they are virulent. The last colony developing possessed as much virulence as the others.

The convenor pointed out that the "American Public Health Association has published standard methods and these may be secured from the Association, 289 Fourth Ave., New York City. (Water and Sewage, cloth $1.25; Milk and Air, paper cover 25 cents).

After a paper on public health laboratory work by Dr. H. W. Hill, of London, Ont., a general discussion took place relative to the scope of this section. Dr. Revell, of Edmonton, believed that for the laboratory section, to attain its full usefulness, it must closely articulate with other public health work and that the function of this section was a wider and more thorough understanding of the possibilities of laboratory work.

After some general remarks by Dr. Higgins on the work accomplished in his laboratory during the past year the officers above named were elected for the ensuing year.

At the Seventh Annual Convention of the Union of New Brunswick Municipalities held at St. Stephen, Dr. Murray MacLaren, of St. John, pointed out that the subject of Public Health was a most suitable one to be considered at a meeting of the Union of Municipalities, because the public health of the province comes first and might be discussed. A vigorous and healthy population is the greatest asset a province can have. It was a subject too which does not receive that prominence and consideration which it deserves. Public health Dr. MacLaren described as a great department of science. It was being made a study of by a large body of scientists, great progress was being made in its advancement from year to year. It was for us to keep apace with the progress made; we must be ready to add to our organization, to change and improve our methods from time to time, in accordance with the growth of sanitary science.

For the successful establishment of public health, two conditions were essential: first, a general knowledge by the people of sanitary mattery and hygiene. Educa-

tion in sanitation was most needful as the co-operation of all individuals is essential to the maintenance of a high degree of public health. A public educated in health matters is the best incentive to governing bodies for liberality in forwarding this work.

The second essential condition was a well organized and well equipped public health department. Sanitary science requried the employment of men specially trained and devoting their entire time and energy to the work and supplied with the facilities necessary to enable them to carry out their investigations, so that the best results might be obtained. It meant the expenditure of money, but what better use could be made of money. In further discussing this subject Dr. MacLaren took up the question of the New Brunswick Public Health Act, and that of Medical Inspection of Schools.

Seven district-medical inspectors have been appointed by the Provincial Board of Health of Quebec: Dr. J. A. Sirois, of Bic, for the Metapedia district; Dr. Savard, for the Fraserville district; Dr. Coullard for the district of Quebec; Dr. L. Parizeau for the district of Sherbrooke; Dr. J. R. Gauthier for the district of Valleyfield; Dr. Corsin for the district of Montreal; Dr. Savary for the district of Three Rivers.

The districts of Chicoutimi, St. Hyacinthe and Hull remain without any provincial health inspector, owing to the shortage of qualified applicants before the Provincial Board of Health.

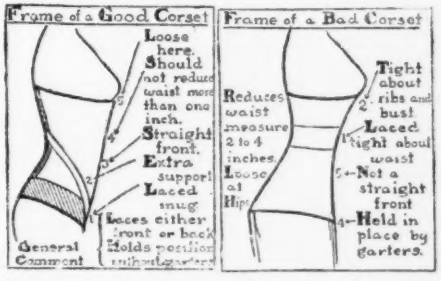
Despite the improvement in the reporting of tuberculosis as a result of the new Ontario Health Regulations, officials of the Provincial Health Department are still far from satisfied with the manner in which the extent of the disease is being recorded. What percentage of tuberculosis cases is never heard of can hardly be determined, but investigation shows that in the weekly reports from local boards only forty per cent of the deaths from the disease are the subject of notification.

A movement, province-wide in scope, was launched last month in Berlin at a meeting attended by 200 citizens, including representatives from Ontario's municipalities interested in civic planning and improvement. The Ontario Town-Planning Congress, as it was called, has for its purpose the securing of legislation along comprehensive lines of civic planning to apply to all municipalities, similar to that on the statutes of New Brunswick. The following resolution was passed:

That in the opinion of this meeting of representatives of Ontario municipalities, called by the citizens of Berlin to discuss town planning and civic improvement along comprehensive lines, the time is opportune for the formation of a provincial organization, and that adequate legislation to that end be sought that a provisional committee consisting of ten members be appointed with power to add to its numbers. The following were named by the meeting to act:—D. B. Detweiler, Mayor Schmalz, H. J. Bowman, J. P. Jaffray, Galt; Mayor O. Bomuety, Preston; W. B. Burgoyne, J. Crombie, St. Catharines; Frederick Riggs, James B., O'Brian, Toronto; Charles Mueller, Waterloo; H. F. Holland, Sarnia; H. L. Hutton, Welland; C. A. Waterous, Brantford.

International.

The points in a correct corset supported from and finding its fixed point at the pelvic girdle, which at the same time maintains that line of beauty down the front of the torso, are here given with a diagram by Dr.


Frame of a Good Corset
Loose here. Should not reduce waist more than one inch.
Straight front.
Extra support
Laced snug
Laces either front or back
Holds position without garters
General Comment
Frame of a Bad Corset
Tight about ribs and bust
Laced tight about waist
Not a straight front
Held in place by garters.
Reduces waist measure 2 to 4 inches.
Loose at Hips

George B. Sommers, of California. Dr. Sommers prepared diagrams, for the recent Clinical Congress of Surgeons of North America, pointing out the good and bad points of a corset, and in considering the basic principles on which a corset should be scientifically constructed, explained that the method of support is of first importance.

In that region of the body covered by the corset, Dr. Sommers declares ,the pelvic bone and spinal column afford the best opportunities for rigid fixing of the frame work.

At the hips, the space between the crest of the ilium and the prominence of the trochanter extended as a zone about the body, lends itself admirably to tight lacing, without danger of injuring internal organs. Lacing here affords a means of holding the corset firmly in place.

Along the back, following the contour of the spine, we may run a more or less rigid piece, forming the rear elevation of the structure.

The strength and supporting properties of the corset rest in this back piece and in the hip zone.

To complete the skeleton framework, a front piece less rigid than the back, but straight, should run up as high as the bust. The other main points are sufficiently explained by the diagrams.

Following recommendations of sanitary experts made at its recent sixth annual convention, the Association of Life Insurance Presidents has decided to concentrate its health reform activities in a movement for the enactment of laws for the proper registration of vital statistics and for the enforcement of those laws.

Its work will include co-operation with the United States census bureau, which is advocating a standard form of registration, and with constituted authorities where there is not at present adequate registration.

"Health bookkeeping," as the association terms the registration of vital statistics, is declared to be essential to an effective campaign for prolonging the lives of life insurance policy holders.

The Canadian section of the International Highways Association has completed the Canadian end of arrangements for the big convention to be held in London, England, from June 23rd to June 28th, 1913. At this convention, which is held every three years, highway engineers and officials from all the progressive countries of the world will be present.

The Right Hon. R. L. Borden has consented to act as honorary president of the Canadian section. The other officers are: president, Prof. John Galbraith, Dean of the Faculty of Science, University of Toronto; honorary secretary, W. A. McLean, provincial highways engineer; executive, W. G. Trethewey, Toronto; T. L. Kennedy, president Ontario Good Roads Association; W. G. Kerr, president Canadian Highways Association; Prof. C. H. McLeod, secretary Canadian Society of Civil Engineers; B. Michaud, Deputy Minister of Agriculture, Quebec, and Hiram Donkin, Highway Commissioner for Nova Scotia.

The committee is endeavoring to secure delegates from every province in the Dominion.

London, as our readers are aware, has been chosen as the venue of this year's International Congress of Medicine.

Plans are now being made for the fitting reception in England of a body of delegates that will be practically representative of the medical profession of the whole world. The congress, which will be the seventeenth international gathering of its kind, is not an annual assembly, but is held at intervals of four years in different capitals, and is attended by eminent physicians and surgeons, medical professors, and practitioners, as delegates from every country.

It is over thirty years since the Congress of Medicine met in England. The London meeting of 1881 was a notable event, but the coming congress promises to surpass most of its predecessors in its scientific and general interest.

The relations of doctors and of hospitals to the State and the community have assumed a new significance, and in view of the possibilities of the establishment, either by the Governments or by doctors themselves, of a public medical service as one of the effects of the introduction of national health insurance, the congress, though exclusively scientific in its objects, will scarcely fail to have a lay as well as professional interest.

The congress will be divided into no fewer than twenty-three sections, one of which will be devoted to naval and military medicine, discussing such matters as the transport of wounded and water supplies on active service.

English, French and German will be the official languages of the congress, though

Italian and Russion may also be held at South Kensington, in the Imperial Institute and the Albert Hall, and the great hall of the University of London will be utilized for an exhibition of medical and surgical science. In this special attention will be paid to the design and equipment of hospitals, both civil and military, and to emergency aids for industrial disasters.

With the object of completing arrangements for the proposed investigation of boundary waters from the St. Lawrence to the head of the Great Lakes, representatives of the Canadian and United States authorities met in Buffalo on December 17. The Joint Commission on the Pollution of Boundary Waters heard further evidence then, but so far as the Canadian authorities were concerned the meeting was chiefly for the purpose of coming to a definite decision regarding the investigation.

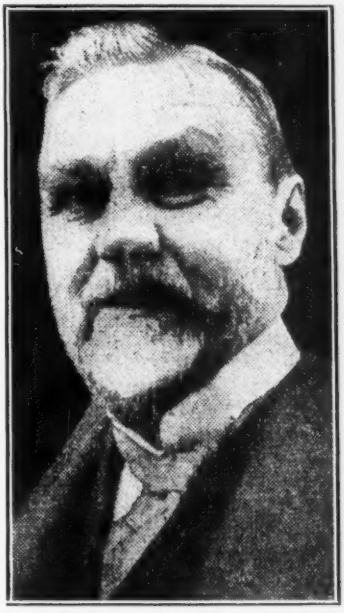
In an earnest effort to get to the bottom of the housing problem and to devise ways and means of making the homes of the people more habitable, more sanitary and more nearly approaching the ideal that modern decency demands 300 men and women, sanitary experts, health officers, real estate owners, manufacturers and social workers, gathered in international convention last month in Philadelphia.

This second annual conference on Housing in America, was attended by representatives from fifty-three cities, most of which had sent their health officers, their tenement heads and their housing experts to throw light upon the subject under discussion and to gain experience from observations and contact with other workers in the new field of scientific sanitation.

Twenty-seven organizations' heads were represented among the 150 out-of-town delegates, ten real estate owners considered the gathering of sufficient interest for them to attend it, and the big insurance companies sent men to report on work they are doing along social lines for their policy holders.

The dominant note struck over and over again by the speakers during the sessions was that as the home is the foundation of society, society owes it to the working classes of the country to make their homes habitable and that it owes it to itself to see that those homes are not breeding places for disease and hot-beds of immortality.

Every phase of the living problem as it affects the poor in their immediate environment was taken up and the concensus of opinion was that the slums of the big city must be abolished by proper legislation, by rehabilitation and by a determined effort on the part of the health authorities to eradicate these sources of contagion.



Robert W. DeForest
Chairman Hcousing Congress

The address of the chairman of the conference, Robert W. De Forest, of New York, president of the National Housing Association, dealt with the need for centralizing housing efforts in all cities and communities, attacking one evil condition at a time and co-operating in every possible way with authorities to get the desired result. The point was brought out in this address that the gathering is not made up of amateurs and theorists, but of the men in power in large cities and of those who have the ability to bring about the reforms that are outlined at the sessions.

Among the speakers were Charles J. Hastings, medical health officer of Toronto,

Can.; C. Hampton Jones, of Baltimore; Dr. James Roberts, of Hamilton; Clyde L. Ford, secretary of the board of health of Cleveland; Grosvenor Atterbury, of New York; John J. Murphy, tenement house commissioner of New York; Chas. J. Allen, secretary of the New Jersey tenement house board; Miss H. Marie Dermitt, secretary of the Pittsburgh Civic Club; Emile G. Perrot, of this city; Flavel Shurtleff, of Boston; E. H. Buton, Baltimore, and W. S. B. Armstrong, Toronto.

United States.

The American Museum of Natural History in New York City is the first great museum of its kind to recognize that the relations between man and his microbic foes is fundamentally a problem in natural history and a special problem of such interest and importance as to warrant the establishment of a museum department of public health which makes itself known to the people through exhibits and other work and publications. The prime purpose of the Museum work is to present the main facts about the parasites, their life history, the conditions which favor their spread to man, their relations to intermediate insect hosts and the means by which mankind may be protected from their attacks. This has been carried forward with greatest energy, as was evident to anyone who glanced at the showing made at the Hygienic Congress in Washington.

In connection with this work of public exhibition there is maintained a museum of living bacteria for the benefit of working laboratories throughout the country. American investigators in bacteriology have heretofore been compelled to send to Vienna for authentic stock cultures and many important type strains have been lost because the laboratories in which they were isolated had no facilities for keeping them under permanent cultivation.

The United States, in showing what sanitation can do toward elimination of fever, at Panama, has set a notable example for all the tropical cities. The government of Ecuador is the first to profit by it, having already asked for the loan of Colonel Gorgas to determine the best means of cleaning up Guayaquil, its principal port, and probably this is the most unhealthy spot along the whole Pacific coast.

At the meeting of the committee for public health education of the Michigan State Medical Society held in Ann Arbor, plans were thoroughly discussed for the organization of the work in Michigan, and plans were also formulated for the work of the county health education committees, which will include the publication in the local press of every community, articles on health subjects, and also advisory work along health lines in connection with philanthropic and religious organizations, women's clubs and educational institutions. The committee will also endeavor to interest various state organizations in the presentation of health topics.

Utah can boast of the lowest death rate from tuberculosis in the world. The state's freedom from the white plague is emphasized in a circular issued by the state board of health to health officers. Only thirty-one in every 100,000 of population dies of consumption in Utah annually. The rate for the whole United States is 161 in every 100,000.

Beginning on January 1st, the New York city department of health will give its services free to all applicants for inoculation against typhoid fever. Inoculations will be made at the home of applicants or at the central office of the department, or the culture will be furnished free to physicians.

The pellagra commission engaged in studying the disease in South Carolina has gathered more data than can readily be laid before the scientists, but thus far the origin of the ailment has not been detected. The Thompson-McFadden fund will be used to send another commission to South Carolina next spring, and the investigation will be maintained in the hope that the cause and nature of the disease will yet be uncovered.

It is pretty well determined that there are 50,000 persons in the south afflicted with pellagra. The disease is less severe than it was one year ago, but the number of cases is not decreasing. The ailment is spreading to all classes of people, whereas once it was confined to those who were not fully nourished.

From Kentucky comes the intelligence that hookworm is known to exist in 102 counties and it is believed to have a foothold in the remaining 18. What is true of Kentucky is true of every other southern state. It is better to face the truth than to evade it.

Hookworm, unlike pellagra, is curable, and it can be overcome. Even in the county in which Louisville is located, 20 per cent. of the population is afflicted with the parasite. The state board of health and the Rockefeller commission have a big task on hand in any southern state, but if local physicians and parents will aid in this matter, it is believed the disease can be eradicated. Ignorance and indifference are to be overcome, and the people aroused to the importance of driving the parasite out of the soil. Soil pollution is the source of the malady which saps the energy of the people and leads to general disease.

Public health work will be given an important place the coming year by the North Dakota Federation of Women's Clubs, as a result of the activity of the public health committee.

Educational work in the rural communities will be featured. Women's clubs will be asked to interest themselves in the carrying on of a campaign with the object of giving the farm women and their children all the information possible on the question of proper sanitation.

In the cities the work will be carried on with the object of getting better supervision of the sale of foodstuffs. Inspection by local officials of the stores handling foodstuffs and methods of making deliveries, will be urged.

The custom of recognizing an aristocracy among prisoners has been dealt a heavy blow by a grand jury in New York city. This body, after an examination of conditions in the Tombs, strongly recommends that the official in charge of the prison be dismissed from the service and this recommendation is seconded by Justice Goff to whom the report was presented.

It was found that in the Tombs a number of convicted prisoners, including a former city official and two bankers, were treated with great distinction and consideration. Their status was that of respected guests. They were given large, airy rooms, and every possible convenience was placed at their disposal.

The undistinguished prisoners, on the other hand, were found crowded two in a cell. These cells are stuffy and unsanitary, many of them never intended for more than one occupant. And the great majority of those thus imprisoned are merely men awaiting trial, men whom the law presumes to be innocent of any offence, many of them doubtless innocent in fact.

This grand jury has stirred public sentiment in New York as it has not been stirred since the Rosenthal murder. The demand is almost universal that the commissioner responsible for the establishment of a prison artistocracy be punished by removal. The case is in the hands of Mayor Gaynor. His refusal to act would indicate that he indorses a pernicious custom by no means confined to New York city, a custom that sets at naught the American principle of human equality and the world wide principle of equality before the law.

Health officers of a number of Northwestern states, in recent conference with officials of several transcontinental lines, have prepared a uniform set of rules for the maintenance of sanitary conditions on railway lines and at passenger stations. The conference was the second of a series arranged some months ago.

The sanitation rules discussed concerned the prohibition of spitting in the cars and depots, the use of sanitary drinking fountains and the cleasing of cars after use, and sanitary conditions in construction camps.

The idea is to have uniform laws and regulations. As things now are, each state has a different set of laws and the railroad companies are put to much trouble in consequence. Those present said there was little doubt but that an agreement would be reached and that the several state legislatures would enact into the laws the reforms agreed upon.

At the conference were present: Dr. E. R. Kelley, Washington; Dr. C. J. Smith, Oregon; William Wallace, Idaho; E. A. Morley, Montana; Dr. John Graffick, North Dakota, and Dr. H. Bracken, Minnesota, and the following railway officials; General

Manager Gruber; Dr. J. A. Quinn, Great Northern Railway; G. A. Van Dyke, Milwaukee Road; Dr. J. H. Rishmiller, Soo Line: Dr. E. J. Evans and D. C. Peckinbaugh, Burlington; W. H. Wilson and W. A. Laidlaw, Northern Pacific; Dr. E. A. Campbell, Illinois Central, and Dr. Thomas Crowder of the Pullman Company.

The Vermont State Board of Health announces, under date of December 1st, figures showing something of the work done at the State laboratory of hygiene during the quarter ending September 30th. There were 1,858 examinations made during the quarter ,of which 255 were of waters, 360 of sputum for tubercle bacilli, 306 cultures for diphtheria bacilli, 178 of blood for widal reaction, 89 of milk and cream, 137 of foods and 506 miscellaneous analyses. Of the 89 samples of milk 19 were below standard, all being either "dirty" or "very dirty." Some of 70 samples that were declared to be above standard were only "barely passable." Of the foods examined 102 were found to be above standard, 11 below standard and 24 unclassified.

The New York city campaign for improved harbor facilities has led to the discovery that because of the inadequacy of the present ones an enormous annual loss is made necessary. It is estimated that under the present docking system there is an annual waste of $200,000,000. This is demonstrated by the report of condemnations made by order of the New York Board of Health, showing that last year 8,500,000 pounds of fruits were destroyed, 2,500,000 pounds of vegetables, 73,000 pounds of eggs, 350,000 pounds of fish and 95,000 pounds of miscellaneous market products.

One of the eastern life insurance companies sends out timely hints about warding off colds and other common winter ills. It suggests the wisdom of taking extra pains at this time of the year, to keep up the tone of the body and fortify it against enemies which cannot be avoided, but may be beaten back by the right kind of physical vigor.

One of the hints given by this insurance company is "Remember that the place to wear a chest protector is on your feet." The common sense of such advice is apparent to all who understand how many ills spring from wet feet, left without proper attention, and from cold feet which are a sign of the lack of good circulation and reasonable vitality.

Another hint from the same source is equally sound. "At the first signs of a cold do not rush to patent remedies, or whisky and quinine, but take a purge,a good hot foot-bath and drink freely of hot flaxseed tea, or of hot water containing a few drops of tincture of camphor Unless you feel better quickly do not wait too long before calling a doctor."

This is plain common sense in its essential features, whatever may be thought of the flaxseed tea or the tincture of camphor. The main thing is to give nature a fair chance by keeping the body in the best possible condition to fight its own battles against winter ills.

The Kansas State Board of Health has published its second annual Health Almanac, for 1913. Information "how to avoid infectious diseases" is presented in an interesting and instructive fashion; the editor declares that there is no speculation nor theorizing in the statements that are made.

A feature of the almanac is the important dates in Kansas history that are set opposite the days of each month. These dates are interspersed with pungent health epigrams in a way that fixes the attention on the subject matter treated.

"Mansions, not stables, should be provided for the cow—the artificial mother of the races; city architects waste their time planning elaborate and costly homes and apartment houses when they could do humanity a greater service by planning sanitary buildings for the city's milk supply." This in brief is the belief expressed to the United States Live Stock Sanitary Association's Chicago Congress held during the first week of December.

Do you eat breakfast every day? Do you drink coffee or tea? Do you have your bedroom window open or shut at night? Do you own a toothbrush?

These and other pertinent questions are to be answered by the children in the public schools of Minnesota. They form part of a "Health Grading Outline" prepared

by the special director of school hygiene for the State, whereby teachers and school nurses may learn in the most direct manner possible the physical condition of the children intrusted to their care. "Rational conservation of the mental and physical health of our school children" is the ultimate ideal of this and other current health projects reported to the United States Bureau of Education.

The appointment of a special State director for school hygiene and the institution of a searching but non-technical health survey by teachers and school nurses are important contributions to the school hygiene movement that is now steadily making it sway throughout the country

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Laws that will compel hotelkeepers to provide clean bedding, long sheets and sanitary sleeping rooms have been urged in resolutions adopted at the first annual banquet of the National Association of Traveling Men in December at Chicago.

The same resolutions asked a law providing that traveling men on the road may vote by mail. Here is a good resolution which should be generally adopted.

The Michigan State Department of Health recently condemned the Ingham county jail because some of the cells were below the ground level and were not in sanitary condition. The county was compelled to build a new jail that was sanitary. In District 6, Lansing township, Ingham county, there is a school house which has a basement room lighted and ventilated by five small windows. In this room were crowded fifty-five small children. The conditions as to light and ventilation were as bad in the school room as in the jail cell. Yet the State Board of Health finds it had no power to order the school board to provide sanitary school rooms, nor, apparently, had any other body.

These ten commandments of good fellowship are published by the Chicago Woman's Aid:

I. Thou shalt honor thy city and keep its laws.

II. Remember thy cleaning day and keep it wholly.

III. Thou shalt love and cherish thy children and provide for them decent homes and playgrounds.

IV. Thou shalt not keep thy windows closed day or night.

V. Thou shalt keep in order thy alley, thy backyard, thy hall, and stairway.

VI. Thou shalt not kill thy neighbors' bodies with poisonous air, nor their souls with bad companions.

VII. Thou shalt not let the wicked fly live.

VIII. Thou shalt not steal thy children's right to happiness from them.

IX. Thou shalt bear witness against thy neighbor's rubbish heap.

X. Thou shalt covet all the air and sunlight thou canst obtain.

Practical hygiene, as it is seen in the four departments of the state board of health, will be taught the twenty-four members of the senior class of the Indiana University School of Medicine. The students, divided into four groups, will visit the laboratories in the State House. One group of students will spend an hour in the executive and vital statistics department, a second in the department of drugs and pure foods, a third in the pathological and bacteriological laboratory, and a fourth in the water and sewage laboratory. The heads of the various departments will address the students. The visits will be continued one day each week until all of the students have gained a knowledge of the work as done by the state health authorities.

Now it is the sugar bowl that spreads disease, according to Surgeon General Rupert Blue of the United States Marine Hospital service. He wants a law to compel restaurant proprietors to keep their sugar covered and customers to use sugar tongs instead of their fingers when helping themselves to loaf sugar. He said:

"Persons with tuberculosis and other contagious diseases are liable to convey them when thus putting their fingers into the bowl. The loose sugar bowl is far more healthy for use in restaurants, because it is generally covered and patrons use spoons.

"If the loaf sugar bowl were abolished it seems that a great source of danger would be done away with."

Empire and World Abroad.

The value of suburban garden towns for the housing of workmen of large cities has been demonstrated in the British Isles since the passage of the housing and town planning act three years ago. Henry Vivian, chairman of the Copartnership Tenants' Movement in England, has gathered interesting statistics as to the effect of country life upon the height and weight of children. He finds that the average child of 7 years brought up in a garden town is three inches taller than the average child of the same age living in a densely populated city. At the age of 14 the difference is still more marked, the garden-town child having the advantage of the city child to the extent of five inches in height and thirty pounds in weight.

In some of the crowded manufacturing towns in England the death rate is forty for every thousand inhabitants, but in garden towns this has been forced down to between eight and nine a thousand.

Not the least remarkable feature of the Russo-Japanese war was the precaution taken by both contestants to keep disease and pestilence out of their armies. The success of the Japanese in this respect excited the wonder of the world, and the authorities have since declared that the Russians achieved even better results.

In the conflict which has been raging in European Turkey exactly the opposite seems the case, cholera and smallpox ravaging the Turkish armies, and to a large extent the Bulgarian forces. The Turko-Balkan conflict seems as noteworthy for apparent indifference to sanitary science as the Russo-Japanese struggle was remarkable for its successful application.

In a recent important communication to the Paris Academy of Medicine Professor Poncet detailed the result of experiments regarding the transmission of tuberculosis by perspiration. He related how, after bringing about a profuse perspiration in consumptive patients by means of hot air douches, he made a careful examination of the perspiration and discovered that it contained 42 per cent. of tuberculosis microbes. Thus Professor Poncet alleges the danger of contagion from the clothes of persons suffering from tuberculosis, or from objects touched by them, is very great, and he urges that in future stricter sanitary precautions must be taken. All the clothes and objects touched by the patient must be disinfected without exception, and the strictest isolation observed. Reference has already appeared in these columns to the increasing use of dinfectants in laundries, and, in view of Professor Poncet's announcement, the importance of this precaution is emphasized. No doubt, too, the same safeguard will be adopted in the many sanatoria now in course of erection or equipment. As Professor Poncet points out, if the tuberculosis bacillus can leave the body by the skin, it can probably enter in the same manner, and therefore it behoves the managers of laundries to adopt every reasonable safeguard.

There are many people who eat no breakfast and they seem to take a pride in the avowal. This habit was referred to at a meeting of the institute of Hygiene in London last month, when Professor Haliburton called it a crank idea and declared it was not only contrary to scientific knowledge but contrary to common sense.

He said, in these days of hurry and bustle the hurried and insufficient breakfast was a weakening influence that made one more susceptible to disease than he would be if he ate a breakfast. Some people omit the midday or evening meal, probably with better reason, but that is not a wholesome habit either. The true rule is to have nutritious food and then not overeat.

According to a French authority standard hygienic milk should have been put through the following processes:

1. Analysis and tasting to remove watered, skimmed, soured or low-grade milk. 2. Filtering or straining to remove mechanical impurities, such as hairs, dust, etc. 3. Pasteurization at a temperature above 176 degrees Fahrenheit and immediate cooling to about 40 degrees to destroy pathogenic microbes, such as those of tuberculosis, diphtheria, typhoid fever, etc 4. Bottling or sealing in sterilized containers. It should then be kept at a low temperature until sold.

The first country to establish this standard for milk was the Argentine Republic,

which enacted statutory regulations as long ago as 1890. These were soon followed by similar laws in various European countries. In Argentina the treatment described has become obligatory.

At the ninety-sixth session of the British General Medical Council held recently in London it was noted with satisfaction that Canada had completed the legislation necessary to provide for the establishment of a Federal Medical Council and a uniform system of registration for the Dominion. To bring this about ten or twelve special Acts of Legislature had been required at the instance of the Central and the Provincial Governments. The organization of the first Dominion Medical Council had been entrusted to the Secretary of State at Ottawa, who was himself a medical man. At his request, their Registrar, (British Medical Council), had forwarded to the new body for its guidance a set of the Council's publications, forms, regulations, etc.

As there appears to be a good deal of doubt on both sides of the Atlantic with regard to the objects and methods of eugenic societies, perhaps you will be good enough, writes Leonard Darwin, President of the Eugenics Education Society of Great Britain, to give me an opportunity of stating briefly what we think they should be.

The main aim of the eugenist, continues Mr. Darwin, is to insure the interests of the unborn of the future always being held in view in connection with all our social customs and all our legislation. For the sake of our fellow-creatures of to-day and to-morrow every effort should without doubt be made to improve the environment of mankind by rational methods. But, as regards the more distant future, we can now practically only beneficially affect the great stream of humanity through the agency of heredity. We desire therfeore greatly to increase the sense of responsibility in connection with all matters pertaining to human parenthood, to spread abroad a knowledge of the laws of heredity as far as now known, and to encourage further research in that domain of science.

With regard to this last point, about which there is little controversy, scientific investigation must remain to a great extent in the hands of such bodies as the Carnegie Institute of Washington, which is pouring forth such a volume of admirable work. Eugenic societies may perhaps play a useful part in collecting material, such as carefully compiled human pedigrees, and in impressing on the public the scientific value of such information when accurately rendered. By means of such cooperation between the general public and the expert investigator progress may be greatly facilitated.

As to our other aims, they will become more definite as our knowledge increases. We can, however, positively affirm that we do not advocate any interference whatever with the free selection of normal mates in marriage. But we firmly believe that, if the moral sense of the nation could be aroused to the importance of the eugenic problem, great benefits would result. These advantages, we hold, would arise because the fit, if suitably mated, would recognize more clearly than they do at present the moral evil of avoiding the duties of parenthood; whilst, if not already mated, they would more often refuse to mate with the unfit. Again, as regards the unfit in body, they would more often refrain from marriage for fear of passing on their defects to future generations.

Hence we regard the educational campaign which we are carrying on as being of the greatest practical importance. There will no doubt always remain a class quite outside the pale of all moral influence, and of these there will be a small proportion who, if they become parents, are certain to pass on some grievous mental or bodily defect to a considerable proportion of their progeny. Here and here only must the law step in. As to whether surgical sterilization should ever be enforced on such persons we have still an open mind, but certainly not till further information on this subject is available. Unquestionably these unfortunates must be treated with all practical consideration, and must be made to feel that they are not being punished for a crime, yet sufficient control must be maintained over them in institutions or elsewhere to prevent them from breeding.

Finally, we advocate economic forces being brought to bear in certain directions;

as for instance, in making taxation, and also the pay of employes in all public services, vary somewhat with the size of the family to be maintained, and in administering the poor law so as not to encourage reproduction on the part of degenerate paupers.

These are, in brief, the aims of our societies, for which we appeal for widespread sympathy.

Though physicians have long realized that, thanks to a better knowledge of sanitation and personal hygiene, people are living longer than formerly, the much greater relative longevity of women as shown in the recently published British National Debt Office's report on the mortality of government life annuitants has come as a general surprise.

In a summary of these figures it was shown that the expectation of life of a woman of 50 is now more than a year greater than it was in 1875, while that of a man of the same age is only three months greater.

Discussing the reasons of our increasing longevity and in particular woman's stronger hold on life, physicians at St. Bartholomew's Hospital advanced widely different theories. "The essential cause of death," one stated, "is a wearing out from overwork of our brain cells. Women may be just as brainy as men, but they do not work their brain cells as vigorously or as continuously as do their male relatives. If they did there would not be so great a disarity in the length of life of the two sexes"

Another consultant puts down woman's greater expectation of life to the more sheltered existence she leads and the lack of the physically depressing competition which is part of nearly every man's life. "A woman may have hard work to do," he explained, "but except for the few who work in offices or who follow professions they work in their own homes and at a pace they set for themselves. The home is also as a rule vastly more airy, sunny and generally more wholesome than is her husband's shop or office."

A shilling a year for rent of a perfectly good three-storey house in the largest city in the world seems small enough to pay, even were prevailing prices lower than they are. Yet this is all Miss Margaret McMillan pays for the Evelyn Medical Home, in Deptford, London, the model "health centre," of which Miss McMillan is at the head.

The house is a historic one, belonging to John Evelyn, a descendant of that John Evelyn, author and traveler who figures in Pepys' diary. The name of Evelyn, with whom Pepys hobnobbed, is familiar even to readers who may not have read the diary through, or who read it so long ago that they have forgotten many of the details.

Pepys and Evelyn were close contemporaries, Evelyn having been born in 1620 and died in 1706, and Pepys lived from 1633 to 1703.

The Evelyn home is only one of many historic landmarks of Deptford, and is fairly juvenile compared with the old Church of St. Nicholas nearby. The tower of this church is said to have been built by King Canute, and the church was at one time attended by the English court. The quiet churchyard, enclosed by a high wall, is in odd contrast with the surrounding streets lined with shops. No burials have taken place in the church yard for over 100 years, and the boys of Miss McMillan's "centre" have the use of it for gardening purposes, and for sleeping out of doors. At night they set up cots, which are taken down in the daytime.

The locality is an ideal one for the study of history, as there are relics and reminders of the early days of England at almost every hand. In the church are very old registers, with the records of family names which are still found in the neighborhood. The children who attend the health centre are descendants of those very parishioners that figure in the annals of the church. Deptford is the scene of the origin of the English navy, and the Czar Peter the Great went there to learn ship building.

In the Evelyn home are rooms for vocal training, the treatment of spinal diseases, and exercises in chest development.

The windows of this house are decorated with a significant device in tiles. Under each sill outside is an Egyptian lotus, which means long life. The tiles were made by boys of the Centre, and typify the work that Miss McMillan is carrying on, to which she referred recently in her lecture, quoted in this journal, on "Schools of To-morrow."

She was the pioneer of a movement that has become nation wide, for the prevention of physical debility and disease among school children Both boys and girls come to the clinics, and girls sleep out of doors in the yard, behind the house, under the charge of Miss Ida Riddell, the specialist in remedial drill and vocal training of the "centre" staff. One night a week the children go home to sleep, and they go home regularly for the mid-day meal, having their other two meals at the Centre. Miss Ruby Seath, the staff nurse, treated over 4,000 children for different ailments in one year.

Through Miss McMillan's initiative and example, similar centres are now being established in connection with the public schools all over England supported by government appropriations. The children are taught hygienic habits of living, and through them the parents also are taught how to bring up the little ones at home.

Professor Metchnikoff, of the Pasteur Institute of Paris, delivered the year's Lady Priestley Memorial Lecture to members of the English National Health Society in the rooms of the Royal Society of Medicine at London. He said that unconscious inoculation by mild or benign "strains" of the tubercle bacillus were known to occur naturally, and to lead to immunity from the disease. "I will give you a little bit of personal history," he said. "When I was twenty-three I married a girl of about the same age, who was so weak from this disease, that she had to be carried up the steps into the church. For four years she struggled against it, only to succumb in the end. During those years I was her constant companion, but neither then nor afterwards did I develop any symptoms of tubercle disease." In a later part of the lecture the professor attributed his immunity to an attack of ocular scrofula in childhood. He was thus "vaccinated" for life.

Fifty years ago Villemin showed by experiment that tubercle could be inoculated into animals. But it was Robert Koch who, thirty years ago, discovered the bacillus which bore his name, and was undoubtedly the germ which engendered tuberculosis. Several species of tubercle bacilli, distinct from that of man, and producing tubercle one in cold-blooded animals, another in birds, and another in mammals, had now been recognized. The species peculiar to man was the great source of human tuberculosis, though preventive measures must also be taken against infection in man by bovine tuberculosis. The existence of cases in which recovery had been made had long been recognized in post-mortem and dissecting rooms. Lately it had been shown that evidence of tubercular disease, healed and past, was nearly universal in all adults in our town populations dying from other causes than tubercle. After referring to Pirquet's test for tubercular infection, the lecturer said that 90 per cent. of the adult population of European towns was shown in this way to have incurred infection by Koch's bacillus, yet only 15 per cent. died of it, a seventh of all deaths. The others, 85 per cent., had recovered, and often had not been aware that they had suffered from tuberculosis. Professor Metchnikoff passed in review the attempts to treat or cure tubercle by drugs, diet, climate, serum, inoculation and vaccination, and discussed Koch's tuberculin. Some of these, he said, were helpful; but no real remedy or sure treatment for tubercle had been found. Unconscious inoculation by mild or benign "strains" of the tubercle bacillus were known to occur naturally, and to lead to immunity. The present diminution in the death rate from tubercle in London, Hamburg, and Copenhagen was probably due to such unconscious inoculation. In twelve years the death rate had fallen from twenty-four deaths per 10,000 of the population per year to thirteen. Natural vaccination (natural infection by mild or modified strains of a disease-producing microbe) was a factor of great importance in the warfare against each kind of infectious disease. The disappearance of leprosy was almost certainly due to the same cause. It was certain that there were abundant sources of the infection of human beings by such mild and "immunising" or protecting strains of the tubercle bacillus. Whether these "races" or "strains" had acquired their comparative mildness in the human body or in other animals, or by exposure to light and other physical conditions, remained to be discovered. To discover these natural immunising races of the tubercle bacillus and the exact conditions under which they occurred, and the way in

which they might be made use of for ensuring the protection of humanity instead of leaving their beneficent invasions to chance, were matters now requiring the most profound and active study. It was in that direction that their best hope existed. The progress in the warfare against tubercle accomplished up to the present justified the hope that in the not far-distant future the great animal Homo sapiens would triumph over the microscopic plant Bacillus tuberculosis.

Lima, the Peruvian capital, will next summer be the scene of the sixth pan-American congress and at the same time of the fifth Latin-American medical congress.

Anxious to prove Peru's right to a place in the vanguard of Latin-American progress, the government and leading citizens are already co-operating to insure a success for both congresses, the most important step taken toward this end being the organization of an international exposition of hygiene to be held in connection with the medical congress.

Ths exposition will last from July 31 until Sept. 30, and the executive committee has just issued a circular letter inviting from all parts of the world exhibits of machinery, drawings, apparatus, etc., connected with the providing of drinking water, treatment of sewage, disposal of refuse and all other matters coming within the scope of hygienic science.

In order to attract exhibits from manufacturers of and dealers in hygienic products it is pointed out by the executive committee that many South American cities are without proper systems of sanitation or have systems which are in great need of modernization. An exhibition of this kind, it is stated, will prove of especial benefit to Peru, because their cities and towns, having been built during the colonial epoch are in urgent need of modern appliances.

Applications for space on the part of intending exhibitors can be made up to May 3.

The Netherlands, as all the world knows, is a country streaming with water—water in the rivers, water in the canals, water bombarding the dikes of the sea coast, water pumped by myriads of windmills and water splashed around by uncounted mops and washcloths. Much of the time there is water in the air, for Holland is a rainy land of mists and fogs. Many outsiders who are not overfond of water, applied externally or used internally, think that such conditions must naturally breed colds, rheumatism, influenza, bronchitis, pneumonia, tuberculosis and other diseases which are often associated with dampness and chills. But it appears from official statistics that the death rate in Holland is wonderfully low. The great Dutch cities put to shame the most fortunately situated and best governed centers of population elsewhere in respect to the annual rate of mortality.

The annual report of Sir George Newman, chief medical officer of the British Board of Education, has just been issued. It is chiefly a record of the work carried out by the local education authorities in England and Wales in the field of school hygiene under the general direction of the Board. Speaking generally, the work of the year is, says the Chief Medical Officer, characterized by three features or tendencies. First, there was a natural development of the efforts of the local education authorities to provide facilities for the treatment of those school children under their charge who had been found by medical inspection to be ailing or defective. In the second place there was a considerable number of local education authorities who found it necessary to extend their interest in school hygiene beyond the actual limits of the child's attendance at a public elementary school. In the report there are particulars of the work which is now being undertaken in respect of teaching infant care and what, for want of a better term, is described as "mother-craft." In the third place experience is showing that for the effective administration of the school medical service it is essential that the various contributory parts of the work should come within the jurisdiction of the local education authority in each area, and that the authority should place their school medical officer in a position in which he can be really responsible for the unification and administration of all the various activities on behalf of a healthy child life.

In the previous report special attention was called to malnutrition, and the statement was made that "defective nutrition

stands in the forefront as the most important of all physical defects from which school children suffer." The truth of this proposition becomes increasingly apparent, and it is evident, says the report, that one of the most fruitful fields for inquiry and investigation on the part of the school medical officer is to be found in the elucidation of the problem, a field of investigation likely to yield results of great practical value. There is evidence that increasing attention is being paid to malnutrition, and several school medical officers have made the subject one of special report.

It is still, unfortunately, necessary, especially in some areas, for the school medical officer and his staff to spend a large amount of time and energy in combating conditions of uncleanliness among children. Defective vision, defective hearing, and heart disease are among the other subjects discussed in connection with the physical condition of school children. Reports for last year show that an increasing number of authorities have made special provision in respect of children suffering from defective sight, but there remain still a large number of areas in which no provision is made. In most areas the estimation of the degree of defective hearing is not carried out with sufficient exactitude. The conditions for such an examination are sometimes not altogether favorable, but in many areas insufficient attention, says the report, is being paid to the subject.

From a table prepared by Dr. Stevenson, Superintendent of Statistics at the Registrar-General's Office, it appears that the mortality from tuberculosis continues steadily to decrease. The death-rate from all forms of tuberculosis among children (under fifteen years of age) is greatest during the first five years of life. The mortality from phthisis is lowest between the ages of five and ten years, and shows a steady increase during the remaining age periods, the increase being particularly marked during the fifteen-twenty age period. The mortality from other forms of tuberculosis declines after five years of age. The comparatively high rate of mortality from tuberculosis under five years of age seems to indicate that infants and young children are extremely susceptible to the disease and withstand it badly. The importance of attacking the disease in childhood cannot be too often repeated, and the fact that the infection, at least in pulmonary cases, is frequently slight in degree, and that spontaneous recovery often occurs, does not mean that effective treatment is not required.

The facts published reveal the exceptional extent to which dental disease occurs among school children from the youngest to the oldest. Figures for Shropshire, for example, show how extraordinarily prevalent dental caries may be even in a county area, and though the children in the country schools are somewhat better off in this respect than those in the town schools the advantage to the country scholars is not so good as is usually supposed, and it is noteworthy that among the country scholars aged five and twelve respectively only from 7—8 per cent. and 3—4 per cent. have sound teeth. At the age of twelve the average number of decayed teeth among country children is, for boy 4.5 and for girls 4.4 the corresponding figures for town children being 5.0 and 4.7 respectively. In discussing the necessity for cleaning teeth it is reported that tooth brushes had been distributed among the children of thirteen schools in the East End of London.

It is somewhat late, says the report, to begin to teach infant management to a woman who has already one or more children. If, however, her sense of personal shortcoming is sufficiently great to lead her to seek guidance and help, she is likely to approach the new methods with a full sense of responsibility, and has immediate opportunity of putting precept into practice. To be of real value the instruction must be given systematically and continued over many months. It is best carried out by means of the so-called "school of mothers." Provision is needed also for the teaching of infant care to girls and young women before they marry. Instruction may be given (1) to the elder girls in Public Elementary Schools, and (2) to girls who have already left schools by means of continuation classes. A practical training of the mothers is, it is pointed out, the first and main requirement, and even though the actual knowledge gained by them may not be extensive, if a mother learns to recognize signs of health and to realize that all small deviations in health

from the normal are important and must be attended to forthwith, much will have been gained.

Taking the country as a whole, there was again little change to record in the activities of local education authorities under the act for the provision of meals to poor children. There was a decrease (7 per cent.) in the number of authorities expending money from the rates on the actual provision of food. There was also a decrease of 712,023 (4.2 per cent.) in the total number of meals provided; this was largely accounted for by the decrease in this particular which was shown by London (8,487,824 meals as against 9,138,755 in 1910). Excluding London, the number of meals provided fell from 7,734,242 to 7,634,395 (1.2 per cent.). Notable cases of increase in this particular were: Bristol, Liverpool, West Ham, Willesden and Rhonda, and of decrease, Durham County, Birmingham, Leeds, Newcastle-upon-Tyne and Jarrow.

The report covers a wide field in regard to the health of school children. School clinics, schools for blind, deaf and epileptic children, the education of the feeble-minded, open-air education, sanatorium schools, and juvenile employment are the subjects of special chapters.

In 1891 and 1893, as a result of the British Government Acts, three separate Rivers Boards were constituted in order to remedy the pollution of the rivers Mersey and Irwell, the river Ribble, and the rivers in the West Riding of Yorkshire. Three Sewage Commissions, reporting in 1865, 1870, and 1884, respectively had stated that the only method to purify sewage effectually for discharge into a river was to apply it to land. These views rendered necessary the provision of large areas of land, and incidentally caused Glasgow to purchase, about 1877, the lands at Dalmuir, only a small corner of which is now occupied by the sewage disposal works there.

The three rivers boards, finding that a sufficient amount of suitable land could not be obtained, turned towards the method of artificial or biological filtration. Although in its infancy sufficient was known of this system to justify the belief that this method would suffice with the use of only a fraction—perhaps one-fiftieth part—of the area required for land treatment. The local government board, however, continued to insist on land treatment, and the consequence was the appointment on May 7, 1898, of the present Royal Commission.

On July 12, 1901, the Commission issued an interim report indicating conditionally the practicability of substituting "Artificial Methods" instead of "Land Treatment," and suggesting the creation of a "Supreme Rivers Authority," to protect the rivers of the country. The prolonged and varied investigation, necessary to solve the many problems involved, followed, and during the thirteen years to 1911 seven reports and twenty substantial supplementary blue books were issued. Probably that of most general interest is the fifth report, dated August 7, 1908. This deals in detail with the various methods available for the treatment of liquid sewage. The pollution of tidal waters, the treatment and law of trades effluents, the manurial value of sewage sludge, give a slight indication of the range covered, while the recommendation for the creation of a central authority becomes more emphatic throughout. It is not surprising that the official publication of such a wealth of technical information tended to obscure the issues.

Prolonged discussions, sometimes litigation, have taken place throughout the country as to the efficiency of different purification works. Much of this would have been unnecessary had the parties remembered that the main objective is the "economical" prevention of actual nuisance in rivers, and that a nuisance which is difficult to find is not a nuisance at all. The eighth report, just issued, is therefore welcome. It bears directly on the main objective throughout, is final for most cases, short, and common sense. As a preliminary the Commissioners reiterate, in direct and explicit language, their recommendation "that the law should be altered so that local authorities should not be required to purify their sewage more highly than is necessary to obviate the risk of actual nuisance arising from its discharge." They then show how, from laboratory experiments, the further guidance necessary for the design of different purification works may be obtained. Chemical standards alone are used, and as regards their application

the report states that "since our main objective is primarily the improvement of rivers and only secondarily the improvement of effluents" the tests should be applied, not to the purified sewage discharges alone, but to the river water after these discharges have entered and mixed with it. They have determined, in terms of dissolved oxygen absorbed in five days, the sufficient minimum standard (0.4 gram. per 100,000 c.c.) for mixed river water, and from this the degree to which the particular sewage discharge must be purified, and how the works required can be determined.

Under the new plans of the health authorities in Germany, large districts are to be placed under a central sanitary administration, and three disinfector automobiles are to be used to enable a comparatively small staff of health officers to handle the work of disinfection necessary in cases of contagious and infectious diseases. The use of the disinfector automobiles will make it possible for the officers to follow up the notifications received from physicians quickly, and to go long distances if necessary.

COMMENT ON BOOKS

[Any book reviewed in this department may be obtained direct from the publishers, or from leading booksellers, or through *The Public Health Journal*.]

"A Treatise on Hygiene and Public Health."

It has been the endeavor of the authors to make this treatise concise, thoroughly reliable and up-to-date; we think they have succeeded, especially in view of the fact that the work has immediate reference to the tropics. Particular attention has been paid to the description of food, disposal of refuse and septic tanks; and a very useful description of insects as carriers of disease is presented.—*A Treatise on Hygiene and Public Health with Special Reference to the Tropics, Dedicated to the officers of the British Indian Medical Service. By Birenda Nath Ghosh, L.M.S. (Cal. Univ.), Fellow of the Royal Institute of Public Health, London; Member of the German Society of Tropical Medicine, and Jahar Lal Das, L.M.S. (Cal. Univ.) Health Officer Maniatala Municipality, Calcutta; formerly Special Health Officer Ghazipur, U.P. With an Introduction by Colonel Kenneth MacLeod, M.D., LL.D., F.R.C.S., Indian Medical Service (Retd.) Honorary Physician to His Majesty the King. Calcutta: Hilton and Company, 5s net.*

"Himself."

The latest of Dr. Lowry's sex educational works has reached us under the above heading. Other books in the series our readers will remember include "Truths," "Confidences," "Herself," and "False Modesty." The author fulfills the demand for such a work, and has carried out his belief that the book should be one that would state facts, intended to be presented, in non-technical terms, and a book written without any attempt to dictate. Dr. Lowry has added interesting chapters on vital issues of the day which most closely concern the home in reference to the subject of this work.—*Himself, Talks with Men Concerning Themselves. By E. B. Lowry, M.D., and Richard J. Lambert, M.D., Chicago: Forbes and Co. $1.00 net, by mail $1.10.*

"The Science of Hygiene."

This is the revised edition of Walker C. C. Pakes' excellent handbook. Some matter not necessary to such a work has been discarded while on the other hand a number of additions have been made and much of the text rewritten, illustrations adding to its value. The book was originally intended for the use of students working for a diploma, but will be found useful to all those interested in public health.—*The Science of Hygiene. A Text Book of Laboratory Practice for Public Health Students. By Walter C. C. Pakes, D.P.H. (Camb.), F.I.C., late Demonstrator of Sanitary Science and Bacteriologist to Guy's Hospital, Etc. New York: D. Van Nostrand Co., 25 Park Place.. $1.75.*

"Love and Ethics."

A commentator sees in this unique little work a creditable display of the author's, Ellen Kay's, logical convictions, challenging as she does the permanence of current

Inter Alia

[Editorials speaking specially for any one association co-operating with *The Public Health Journal* are not published in this Journal until passed by the publishing committee of that association.—Ed.]

IT has been said that it is the bad workman who spoils his tools and afterwards complains of them. The chief tools of a business man are his own healthful mind and the healthful mind of his associates—it being just as much a part of the employer's problem in seeking prosperity to see that he and his associates have proper holidays and proper surroundings in the shape of air, housing, and food, as it is a part of a general's problem to protect his army from disease or starvation.

IN view of the increasing difficulties of the competitive system in business and the continual strain of present industrial conditions, the growing demand for business proficiency means a growing demand for health.

SANITARY science teaches that mode of life which promotes health and efficiency. And to secure and maintain a safe environment there must be inculcated habits of using the material things in daily life in such a way as to promote and not diminish health. It is in this true that what touches one's neighbor touches one's self—the first law of hygiene requiring quick removal and destruction of all waste, and the second law enjoining pure air, pure water, and the good food and housing necessary to the life of every person who is enjoying health and who is doing his part efficiently.

PUBLIC health officials are supposedly elected or appointed for their wisdom and capability as instructors and achievers in this direction; and it is as much a part of the public health official's duty to advise those in authority in the business world of his community as it is for him to keep clean the community's back yards and its streets. But such advice is as of little use unless acted upon as are clean-up movements unless sustained.

ATTENTION to public health matters from a municipality standpoint is profitable. If the sanitary conditions of a city are known to be good people will gravitate toward it, business will flourish therein, and the man who works for his daily bread will do so in such a city with greater physical efficiency and consequent financial benefit both for himself and his employers; it is good business for a city to have a good drainage system, to prevent devastating outbreaks of disease, and for this purpose to maintain its health department in the highest degree of usefulness by adequate expenditures.—It is right in our opinion that a city which makes inadequate expenditures and efforts, to maintain and advance the health of its citizens, should be held accountable by anyone whose business or person may be damaged thereby; the recent situation in the Canadian capital being a case in point.

THERE is no stronger obligation, no higher privilege, of citizen or corporation, than to submit to restraint and discipline designed for protection of the public health.

AS the result of growing public intelligence and resultant interest in public health matters as manifested to-day—and the presentation of the public health problem in so many different aspects—there have come into existence a large number of organizations, local, national and special, which have taken up different phases of the health problem as their peculiar work. There is no doubt that the work of these organizations has been well planned, but we believe that efficiency has been militated against from a financial and public point of view by tiresome duplication.

In the business world the tendency is for consolidation and simplification rather than toward complexity and multiplicity in order to attain the results which are also required in public health work.

THE question has arisen recently of greater consolidation and concentration in reference to efficiency of service both in the voluntary and official aspect of public health administration.